

CARILEC UTILITIES GIS SURVEY (2004)		UTILITIES WITH A GIS									
TOPIC	SUBTOPIC	Antigua	Aruba	Barbados	Bermuda	BVI	Cayman Islands	Dominica	Grenada	Jamaica	
Company Data	Name Of Utility	Antigua Public Utilities Authority	N.V. Elmar	Barbados Light & Power Co. Ltd.	Bermuda Electric Light Company, Ltd.	B.V.I. Electricity Corporation	Caribbean Utilities Co. Ltd	Dominica Electricity Services Ltd.	Grenada Electricity Services Ltd.	Jamaica Public Service Co. Ltd.	
	Number of Employees	110	170	480		170	217	189	171	Approx. 1500	
	Geographical Area Covered	108 square miles	Aruba	166 square miles (430 sq.km)	Islands of Bermuda, North Atlantic	Entire British Virgin Islands	196.8 km	754 sq.km.	133 sq. mi.	Island of Jamaica	
	Postal Address	Cassada Gardens, St. John's, Antigua, West Indies	Wilhelmina Straat 110 P.O. Box 202, Oranjestad, Aruba	The Garrison, St. Michael, Barbados	P.O. Box HM 1026, Hamilton HM DX, Bermuda	P.O. Box 268, Road Town Tortola, British Virgin Islands	P.O. Box 38. 6T, 457 North Sound Road, Grand Cayman, Cayman Islands B.W.I.	18 Castle Street; P.O. Box 1593, Roseau, Commonwealth of Dominica, West Indies	P.O. Box 392, Halifax St., St. George's, Grenada	6-7 Knutsford Blvd, Kingston 5, Jamaica, W. I.	
	Generating Capacity		210.5 MW	209.5 MW (peak load ~ 141.7MW)	144 MW	4504 MW Installed	123MW			Approx. 600 MW	
	Approximate No. of Poles	18,000	20,928	65,600 (at end of June 2004)	17,000	No good estimate available	12,500			250,000	
	Customer Base		34,802	107,000	32,000	12,346	20,000			Approx. 450,000	
Electric Network	Transmission - High / Low Voltage	69kV	60kV	69/24 kV	33/22 kV	34.5kV / 13.2kV	69kV			138kV/69kV	
	Distribution - High / Low Voltage	11kV High Voltage and 120/240v, 120v, 240v	12kV/ 127 - 220 3Phase	11KV/115 volts	4.16	13.2 kV / 120/208V or 480V	13kV			24kV/4kV	
	Lines / Pole path - Approx % Cross-country	10% cross-country		90% of the country is rural (approx 10% is urban) but only about 1% of the poles stray cross country from the path of roads	0%, everything urban	no good estimate available	50%			85%	
GIS Focal Point Person - Contact Information	Name	Michael Wynter	Alcide Wever	Dr. Philip Corbin	Albert Carey	Henry Creque	Cindy Savage	Ian Charles Sorhaindo	Shawn Charles	Devon Dawson	
	Position in Organisation	Planning Supervisor	Chief GIS	Computer Engineering Analyst	Supervisor - Engineering Services	Distribution Engineer (Ag)		Planning and Development Engineer	Engineering Assistant	Senior Analyst	
	E-Mail address	<a href="mailto:damv@apua.ag">damv@apua.ag</a>	<a href="mailto:elmar_aruba@setarnet.aw">elmar_aruba@setarnet.aw</a>	<a href="mailto:philip.corbin@blpc.com.bb">philip.corbin@blpc.com.bb</a>	<a href="mailto:acarev@belco.bhl.bm">acarev@belco.bhl.bm</a>	<a href="mailto:henry_creque@bvielctricity.com">henry_creque@bvielctricity.com</a>	<a href="mailto:csavage@cuc.ky">csavage@cuc.ky</a>	<a href="mailto:ian.sorhaindo@domleconline.com">ian.sorhaindo@domleconline.com</a>	<a href="mailto:scharles@grenlec.com">scharles@grenlec.com</a>	<a href="mailto:ddawson@jpsco.com">ddawson@jpsco.com</a>	
	Tel #	268-480-7000 ext. 7210	523-7164	246-430-4465	441-295-5111 Ext 1400	284-494-3911	345-914-1910	767-448-2681 ext 173	473-440-2650 ext. 437	876-920-5452	
	Mobile #	268-773-8384			441-525-1400	284-499-1578	345-916-0129				
	Fax #		297-582-8991	246-436-9933		284-494-4291	345-949-5203	767-448-7284	473-440-6673	876-920-2542	
Information if Utility is without a GIS	Do you think GIS will assist?										
	Is a GIS planned?										
	When will GIS plans commence?										
Information if Existing GIS	Year initiated	1995	2002	1989	2002	approx. 1995	1995	2003	2000	1991	
	Pilot Project? (Yes/No)	Y	N	Y	Y	N	N	Y	N	Y	
	Number of persons on GIS team	4	7	2	2	No proper team established	3	3	1	2	
	Currently in use by staff outside the GIS team?	Y	N	Y	Y	Y	Y	Y	Y	Y	
	Hardware	Desktop Computers, Trimble receivers, compact Ipac, digitizing boards, plotters	Server - RS-6000, Client - Dell Desktop computer	Compaq Proliant DL320 with 1.5 GHz RAM	Compaq PCs and Servers	Pentium IV Process	Compaq e.g. Evolu4000 series	Pentium CPU 2.4GHz 512 Mb of RAM	Workstation PC, PC server and complete Leica GPS system	Dell PowerEdge 4200, 20 Gig Hard-drive 2 x 200 MHz Processors, 320 Mb memory	
	Operating System	Windows 2000 professional; Window XP Professional	Server - Unix 4.3.3 Client - Windows XP	Windows 2000 server with Service Pack 4	Windows 2000 Professional	Windows 2000 Server	Windows 2000, XP	Microsoft Windows XP, Professional version 2002, SP1	Windows 2000	NT Server 4.0	
	Software	Arc info, ArcGIS, AutoCAD 2004	GE SmallWorld	WHIP (AutoDesk plug-in for browsers); Internet Information Server 5.0, Active Server Pages	ArcGIS 8.3.2, ArcFM 8.3.2 sp2, ArcSDE 8.3, ArcIMS 9.0, ArcSchematic 8.3, ArcFM Viewer 8.3	Arc-View GIS 3.2	Partner (Mapviewer); Windmil 2map (milsoft); Windmil (milsoft); AutoDesk 5; Disppatch (milsoft)	Two ESRI Arcmap 8.3 floating License, with one extension of Publisher and one 3D Analysis floating License; Pathfinder 2.0; Arc	Imtergraph Geomedia 3.0, ESRI Arc-GIS 8.1 Ilwis 3.2	ArcInfo 7.2 (2 Licenses) and ArcView 3.2	
	Databases	ArcGIS Geodatabase	GE SmallWorld	Microsoft Access 2000; OpenVMS Flat files	Oracle 9i	Each theme has its own table and is part of the ArcView software	SQL, Access	Microsoft Access; SQL	Microsoft Access, GIS software proprietary database	ArcInfo	
Network	Class B, Windows 2000 server, Cisco switches		1.5 Megabits/sec Fibre Backbone with ~ 250 PCs connecting at 10/100 MB/sec	TCP/IP	Windows Network	Microsoft Server 2000 running over Cat 5	Ethernet Network, 100Mbs Backbone	N/A	TCP/IP Ethernet 100Mbs/10Mbs		
Back-up & Archiving Facilities	Backup copies are done on disks and archiving is done via network server.		ArcServer 2000 Version 7		Backed up to tape daily	Veritas Backup Exec (to tape)	Cds, Server backups, computer backups	N/A	Tape Drives		
Geographic Data (U = Use Presently, C = Considered)	Aerial Photography	U	U	C		C	U	C	C	U	
	Area Names	U		U	U	U	U	U	U	U	
	Building Footprints	C		U	U	U	U	C	C		
	Contours/DEM	C		C	U	U	C	U	U	U	
	Digital Photography	U	C	C	C	C	C	U	C	C	
	House/Lot Numbers	U	U	C	U	U	U	C	C		
	Land Use Info	C		C	U	U	U	C	C	C	
	Land Parcel Boundaries	U	U	C	U	U	U	C	C	U	
	Road Line Network	U	U	U	U	U	U	U	U	C	
	Road Names	U	U	U	U	C	U	U	C	U	
Postal Boundaries	C		C			U	C	C	C		

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Utility Facilities Data (U = Used presently, F = Future use anticipated)	Satellite Imagery	U		U			C	C	C	U
	Substations	U	U	U	U	U	U	F	F	U
	Switches	U	F	U	U	U	U	U	U	U
	Poles	U	U	U	U	U	U	U	U	U
	Street Lights	U	U	U	U	U	U	U	U	U
	HT Equipment	U	U	U	U	U	U	U	U	U
	HT Phases	U	U	U	U	U	U	F	U	F
	LT Phases	U	U	U	U	F	U	F	U	F
	HT U/G Cables	U	U	U	U	U	U	F	U	F
	LT U/G Cables	U	U	U	U	F	U	F	U	F
Data Attributes (U = Used presently, F = Future use anticipated)	Pole Numbers	F	U	U	U	F	U	F	U	F
	Dates of Change	F	F	U	U	F	U	F	U	F
	Text Attached to Features	F	U	U	U	U	U	U	U	F
	Identification of Building Types	F	U	U	U		U	F	F	F
	Land Parcel Identifier	U		F	U	U	U	F	F	F
	Theme / Layers Information	U		U		U	U	U	U	U
	Area Measurements	U		F		U	U	U		F
Polygons	U		F			U	U		F	
Scale of Maps	(A) 1:500 (B) 1:1250 (C) 1:2500 (D) 1:5000 Other	Other	Other	A,B,C,D	A,B,C,D,Other	C	C	C,D, Other	C	
Accuracy Expected / Required	(A) 0.1 (B) 0.5 (C) 1 (D) 2 (E) 5 (F) 10 (G) Other	C	D	F	D	C	D	A	A	C
Frequency of Updating	(A) Daily (B) Weekly (C) Monthly (D) Other	A		A (Data refreshing has been automated by software programs)	A	B	A	D	A	
Data Storage and Retrieval	(A) Paper-based (B) Partly Digital (C) Completely Digital	C	B	C	B	C	C	A,C	A,C	C
Method of Access	By (A) Coordinates (B) Customer (C) Land Parcel Identifier (D) Point & Click (E) Pole # (F) Postal Address	B,C,D	D,E,F	A,B,D,E,F By other means: Service#, Meter#, Customer#, Telephone#, Large Power Customer Name; Pole#, Pole Plan data, Pole height, Pole type (e.g. Concrete or Wallaba), Pole hardware attachments (e.g.fuses, HT cable drops), Utility Attachments, HT or LT Phasing, Capacitor#, Transformer#, Transformer size, Transformer Installation Mode, Street Light Type, Switch#, Map ID, Feeder Name, Map Type (Vector & scanned backdrop, or Vector & Satellite image backdrop).	B,D,E, By Other means: Map Sheet Tile, Switch#, Protective Device#, Telephone#, Account#, Transformer#	C,D	A,B,C,D,E,F Other means: meter#, meter Location ID, phone number	D,E,F By Other means: Feeders, Road information and historical names of different locations	A,D,E	A,D
Method of Data Capture	(A) Purchased (B) Procured by GPS (C) Procured by Digitising	B,C	Acquired by Field Application (Spy). Format is Vector	Digitising (vector) & scanning (raster) of paper maps from Land & Surveys Dept.	Phase 1 - Digitization from Paper: Baymont was contracted by BELCO to convert 4 KV network from paper maps to ArcView 3 shape files for use with the CES centrality Outage Management System. Phase 2 - Shape files to Geodatabase: ESRI shapefiles were converted to an ArcFM geodatabase. Phase3 - Field Mapping and Verification: All data located within the ArcFM geodatabase has been field verified and missing attributes have been populated such as pole birth dates, height, and class. This data was captured using the disconnected editing functionality within ArcGIS in conjunction with edit tools in ArcFM. This was done using tablet PCs, not containing GPS. It was determined that		We captured all our data by GPS (Trimble - Pathfinder)	Y - As result of the joint Cable & Wireless project we were able to obtain base maps, geographical data and geography coordinate information. From the Dominica land Survey we were able to obtain contour information i.e. 50 and 100 ft contours. At our disposal are two Trimble Windows CE devices with additional accessories that we use for capturing external geographic data.	Procure vector date (Contours, Hydro and Road features) from Intec Americas Corp.	GPS, Digitising, Paper, Vector, Raster

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Is Data Shared with other organisations?	(Y)es (N)o	N	N	Y - A data sharing exchange project was initiated in 2000 with Cable & Wireless BARTEL re: their customer phone number database and our pole numbering database, to the mutual benefit of both. This exchange was to have been annual but has so far been only a one-off sharing of data	N	Y	Y - Government land Registry - monthly; Cable & Wireless - 6 months; Water Authority - 6 months	N	Y - The proposed plans for data sharing will make use of state-of-the-art technology, which includes Internet and Intranet, mobile application services in collaboration with Internet Services Providers.	Y - Email and CD	
Outputs	(A) Monochrome Plots (B) Colour Plots (C ) Digital Files		A,B	A,B,C	A,B,C	A,B,C	A,B,C	B,C	B,C	A,B,C	
Main Current Uses			For information purposes contractors	For use with our estimating system; distribution engineers; pole inspection programme; trouble calls center; customer service queries	Engineering and Planning, Design, Outage Planning, Location, Operations, Switching Activities etc. . . . , Joint Use Reporting, Damage Assessment, Safety Violations, Circuit Reports, Customer Reports.		Staking (line design); T & D line crews; Meter reading and new service locations; switching purposes	The colour plots allow for the identification of feature at a particular location by field staff. The digital file is needed for the distribution of information via the Publisher extension.	Asset Identification; Distribution and Network Analysis; Work order and service order applications	Distribution Planning and Designs	
Interfaces: Y = System in place; Y-Y = GIS Interface to that System is also in place	Asset Management			Y - Y	Y - Y	Y	Y - Y	Y	N - Y		
	Automated Meter Reading	Y	Y						N - Y		
	Customer Information System	Y	Y	Y - Y	Y - Y	Y	Y - Y	Y	N - Y		
	GPS	Y - Y					Y - Y	Y - Y	Y - Y	Y	
	Job Estimating	Y - Y		Y - Y		Y	Y	Y	N - Y		
	Network Modeling Analysis			Y		Y	Y - Y	Y	Y - Y		
	Outage Management	Y			Y - Y		Y - Y		N - Y		
	SCADA	Y	Y	Y - Y	Y	Y	Y	Y	Y - Y		
	System Schematic Drawing		Y	Y - Y	Y - Y	Y	Y	Y			
	Transformer Load Management			Y - Y			Y - Y		N - Y		
Vehicle Navigation / Tracking				Y							
Work Management System			Y	Y - Y	Y	Y		N - Y			
Future Plans to develop your GIS		To be the operating system that would allow the electricity division to be more efficient and accurate. To see decisions made immediately based on a report made anywhere on the island because of accurate and complete maps. To see data that was collected be used it as a business tool to assist other agencies. To see Arc SDE implemented in A.P.U.A	We plan to use it in our planning phase and for maintenance purposes	Interfacing to our Work Management System (currently being worked on); allowing users to place their own symbols or text on the maps (i.e. redlining; currently being worked on); incorporating GPS for faster and more accurate correlation of outdoor facilities with our gridnumbering system; getting the maps out (from just office PCs) to engineers and crews in the field via laptops and/or hand-held devices; interfacing to (yet to be developed) Outage Management System; interfacing to network analysis software (re systems losses); perhaps placing maps on out Internet website; hopefully interfacing one day with a national GIS.	Implementation of a staking or Design tool integrated with GIS, integration with an engineering analysis package, integration with SCADA to minimize rework, use by employees across the company	Better management of field assets; Easier customer location; Evaluate reliability of supply to different geographic locations; Use data available to aid in system planning.	Vehicle Navigation System, Automatic Meter Reading.	Full integration of GIS with all the System software in the company; To map to its entirety all DOWLEC external assets together with other information such as roads, houses, bridges, business and manufacturing complexes; Airports ext.; To provide training to selective staff; To make available GIS in its veiwing and querying mode, to all staff in our company; To create a working environment that will satisfy the respective needs of each department within our company.	Making the entire information center available to all those requiring it throughout the company. Provisions were made for even the field crews to be able to access corporate information that can assist them in maintaining a height level of efficiency.	Everything in interfaces section	



CARILEC UTILITIES GIS SURVEY (2004)		UTILITIES IN GIS PLANNING STAGES				UTILITIES WITHOUT A GIS		
TOPIC	SUBTOPIC	St Lucia	Nevis	St Kitts	St. Vincent	Belize	Curacao	Guyana
Company Data	Name Of Utility	St. Lucia Electricity Services Ltd.	Nevis Electricity Company Ltd.	St Kitts Electricity Department	St. Vincent Electricity Services Ltd	Belize Electricity Ltd	Aqualectra Distribution	Guyana Power & Light Inc.
	Number of Employees	250	76	150	270	242	430	1100
	Geographical Area Covered	Island of St. Lucia, 238 sq.mi.	36 sq.mi.	Entire island	150 sq.mi. (including the Grenadines)	Not clear as to what this means	Curacao, 444 sq. km.	250 sq. mi.
	Postal Address		Pinney's Commercial Site, Charlestown, Nevis	Central Street, Basseterre, St. Kitts	P.O. Box 856, Paul's Avenue, St. Vincent	21/2 Miles Northern Highway, P.O. Box 327, Belize City, Belize, Central America	Pater Eeuwensweg 1, Willemstad, Curacao	40 Main St., North Cummingsburg, Georgetown, Guyana; Alt 257 - 259 middle St. South Cummingsburg, Georgetown, Guyana
	Generating Capacity			32.4 MW	36,829 MW (mainland installed) 6,700 MW (Grenadines, installed)	49.3 MW + 53 MW (through Power Purchase agreements)	75 - 140 MVA	105.8 MW
	Approximate No. of Poles	40,000			16,000	61,000	High Voltage 7,000, Low Voltage: 60,000	500,000
	Customer Base				34,000	63,000	Approx. 60,000 for water & electricity	185,000
Electric Network	Transmission - High / Low Voltage	66kV		N/A	33kV	115kV/34.5kV	66kV, 30kV	69kV
	Distribution - High / Low Voltage	11kV/415kV/240v		11,000 / 400 / 230 volts	400v (3-Phase) 230v (single phase)	22kV/6.7 kV	12kV, 220v, 127v	(13.8 kV, 11kV, 4kV); single-phase 120/240v, 240v, three-phase 120/240v, 120/208v, 240/415v)
	Lines / Pole path - Approx % Cross-country				10%	Not sure what this means	60%	0.03%
GIS Focal Point Person - Contact Information	Name	Cornelius Edmund	Anelda Maynard		Dr. Vaughn Lewis	Jose A. Moreno	Inca Dowling	Miguel Kellman
	Position in Organisation	System Planning Engineer	Transmission and Distribution Engineer		Senior Planning Engineer	Belize Electricity Ltd	Business Improvement Advisor	System Planning & Design Manager (ag)
	E-Mail address	<a href="mailto:cedmund@lucelec.com">cedmund@lucelec.com</a>	<a href="mailto:tdeng_nevlec@caribsurf.com">tdeng_nevlec@caribsurf.com</a>		<a href="mailto:vwlewis@vinlec.com">vwlewis@vinlec.com</a>	<a href="mailto:jmoreno@bel.com.bz">jmoreno@bel.com.bz</a>	<a href="mailto:idowling@aqualectra.an">idowling@aqualectra.an</a>	<a href="mailto:gpl.design.plan@solutions2000.net">gpl.design.plan@solutions2000.net</a> ; <a href="mailto:miguelkellmangy@yahoo.com">miguelkellmangy@yahoo.com</a>
	Tel #	758-457-4518	869-469-7243/7249		784-456-1701	501-227-0954	599 9 4632 287	592-225-7923
	Mobile #	758-484-6741			784-528-7501	501-610-2506		592-624-2378
	Fax #	758-457-4609	869-469-7249		784-456-4681	501-223-0891	599 9 4632 180	592-227-1123
Information if Utility is without a GIS	Do you think GIS will assist?		Y	Y	Y	Y	Y	Y
	Is a GIS planned?			N	Y	N	Y - we expect to have the GIS implemented by mid 2005	N
	When will GIS plans commence?				Y	1 - 5 YEARS	Within next year	1 - 5 years
Information if Existing GIS	Year initiated							
	Pilot Project? (Y)es (N)o	Y		N				
	Number of persons on GIS team	3			6			
	Currently in use by staff outside the GIS team?	N			N			
	Hardware	2 Dell Xeon Workstations, Trimble reference station, Trimble GPS Pathfinder Pro, Trimble TSCE field device	POWEREDGE 2650, 2.5GHz, XEON, RAID 1/RAID 5; (to be installed)					
	Operating System	Windows 2000	WINDOWS SERVER 2000 (to be installed)					
	Software	ESRI Arc editor, ArcGIS Publishing Extension, GPS Pathfinder						
	Databases	ESRI, Excel	MICROSOFT SQL DATABASE (to be installed)					
Network		SERVER BASED TCP/IP (to be installed)						
Back-up & Archiving Facilities	Integrated with daily LAN backup	DELL POWERVAULT NETWORK BACKUP						
Geographic Data (U = Use Presently, C = Considered)	Aerial Photography	U			C			
	Area Names	U	C		C			
	Building Footprints				C			
	Contours/DEM	U			C			
	Digital Photography		C		C			
	House/Lot Numbers							
	Land Use Info	C	C		C			
	Land Parcel Boundaries	U	C		C			
	Road Line Network				C			
	Road Names	U	C		C			
Postal Boundaries								

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TOPIC	SUBTOPIC	St Lucia	Nevis	St Kitts	St. Vincent	Belize	Curacao	Guyana
Utility Facilities Data (U = Used presently, F = Future use anticipated)	Satellite Imagery				C			
	Substations	U			U			
	Switches	F	F		U			
	Poles	F	F		U			
	Street Lights	F	F		U			
	HT Equipment	F	F		U			
	HT Phases	F	F		U			
	LT Phases	F	F		U			
	HT U/G Cables	F	F		U			
	LT U/G Cables	F	F		U			
Data Attributes (U = Used presently, F = Future use anticipated)	Pole Numbers	F	F		F			
	Dates of Change	F	F		F			
	Text Attached to Features	U	F		F			
	Identification of Building Types	U	F					
	Land Parcel Identifier	F			F			
	Theme / Layers Information	F			F			
	Area Measurements	F	F					
Scale of Maps	Polygons	F	F		F			
	(A) 1:500 (B) 1:1250 (C) 1:2500 (D) 1:5000 Other	C			C			
Accuracy Expected / Required	(A) 0.1 (B) 0.5 (C) 1 (D) 2 (E) 5 (F) 10 (G) Other	C			C			
Frequency of Updating	(A) Daily (B) Weekly (C) Monthly (D) Other							
Data Storage and Retrieval	(A) Paper-based (B) Partly Digital (C) Completely Digital	B	A,C		A			C
Method of Access	By (A) Coordinates (B) Customer (C) Land Parcel Identifier (D) Point & Click (E) Pole # (F) Postal Address	B,C	D		By other means: At the moment we recognize information on the map by pole structure and location of switches and transformers			
Method of Data Capture	(A) Purchased (B) Procured by GPS (C) Procured by Digitising	Paper maps and digital map in vector format			Paper			

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TOPIC	SUBTOPIC	St Lucia	Nevis	St Kitts	St. Vincent	Belize	Curacao	Guyana
Is Data Shared with other organisations?	(Y)es (N)o	Y - meter numbers via email			Y - No digital data but we share whatever information we have about the location of our field facilities			
Outputs	(A) Monochrome Plots (B) Colour Plots (C ) Digital Files	B,C	B,C		A,B,C			
Main Current Uses								
Interfaces: Y = System in place; Y-Y = GIS Interface to that System is also in place	Asset Management							
	Automated Meter Reading				Y			
	Customer Information System	Y	Y		Y			
	GPS							
	Job Estimating		Y		Y			
	Network Modeling Analysis				Y			
	Outage Management							
	SCADA	Y			Y			
	System Schematic Drawing				Y			
	Transformer Load Management							
Vehicle Navigation / Tracking								
Work Management System		Y		Y				
Future Plans to develop your GIS	To develop a fully integrated GIS		We have not yet implemented GIS to our system. We have done a GIS workshop and we are interested in getting a need assessment done. By the end of the year or early next year we are expecting that we will complete the GPS mapping of the system.		VINLEC started a GIS pilot project on April 26 2004.The main initial objective is to collect all data associated with the T&D network and customer locations along with electrical connectivity and to develop proper procedures to maintain this data. Future plans will depend not he success of this initial phase	BEL is looking forward to the development of a GIS within the next 2 - 3 years. The intent is to start with a basic system and gradually build on it.		None immediately

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The Future	Anticipated Obstacles		Trained human resource, Capital		Obstacle that may occur include acquisition of base maps, possible inadequacy in staffing levels, implementation of procedures to maintain data, accuracy of data collection and cost of equipment, software and consultants	Accessing quality survey data will be critical for the success of such a project. Coordinating the acquisition of other computer systems that have the capacity to interface with GIS selected is also important		Lack of resources (financial, manpower, tools, software etc.); Decisions by Government to re-privatize GPL or take up as a total government entity.
	Training Requirements		We are presently reviewing schools where we can get at least one person professionally trained in GIS and the other employees to work in this area, be trained in computers, and basic GPS & GIS operations. Each worker will be required to have a basic knowledge in the function and operation of GIS		Not yet established	The company will have to re-start a GIS project from the basics. Training requirements will therefore need to match those needs.		GIS software & hardware tools; Basic foundations in GIS; Use of AutoCAD to convert line-based mapping to electronic form; GIS implementation.
	How CARILEC can assist		Provide clear guidelines as to steps to implement a functional GIS system; Identify schools where training in GIS can be done; update us on conferences, seminars etc., on GIS; Provide a central point/link to persons/institutions that can assist us in troubleshooting.		Collaborate sharing of knowledge, coordinate training in general GIS and for utilities and other agencies using similar software, and access to funding that may exist in the region for GIS development.	CARILEC can assist by sharing information on GIS programmes that have been implemented by other member utilities and have been successful. This will allow us capitalize on these utilities experience and assist in the selection of a programme that is workable and will have a greater chance for success.		By providing software that other utilities currently have in use. Co-sponsoring GIS formal training to providing links to Caribbean utilities with GIS use. Provide if possible, more workshops for newcomers to GIS. Forwarding appropriate steps where to begin to GPL so as to implement GIS programmes.
	Comments / Feedback				We are just in the initial stage (thinking) of implementing a GIS system			