6. Discussion

6.1 Data Accuracy

One of the most important items in the GIS preparation is the accuracy of data. The places where the accuracy of data is of a concern were identified and checks were carried out to identify the effect on the system.

Listed below are the instances where the data accuracy is very important.

i. Accuracy of Data collection from duplicated map copies (Section 4.2.41.1)
ii. Land Parcel extent accuracy (Section 4.2.4.1.3)
iii. Land Parcel length accuracy (Section 4.2.4.1.4)
iv. Attribute data accuracy (Section 4.2.4.1.5)

Error computations for all above cases were studied to identify the error values in each situation.

Errors due to age of data, digitizing error and scanning error may, affect the positional accuracy (Section 4.2.4.1). The study revealed that the errors due to these factors are less than 0.5 m^2/Ha for the cases studied (Section 4.2.4.1.3).

The study involved significant field inspections to carry out various actual measurements in order to verify the accuracy of the collected data. The average error was identified was 1.45m/Km (Section 4.2.4.1.4). At these inspections, it was observed that positional accuracy is being affected to a considerable extent by the age of data. When data is being achieved in various forms, the error could accumulate either in the direction plus or minus. It is not possible to assess them in a measurement as it differs in relation to time and direction. Various methods could be adopted in order to check the correctness of data that had been collected. Field visits, physical observations, Field measurements, land marks, road names etc., are some of the methods

carried out for data verification. Following recommendations could be made in the case of data collection for LIS developments.

i. Data collection has to be done with care and the accuracy of them should be computed and checked for adequacy
ii. Every possible attempt should to be taken to collect data from original maps
iii. Field surveys need to be carried out to identify and eliminate data errors including the changes with time
iv. The number of field visits can be increased or decreased depending on the size of the study area

6.2 System Accuracy

The verification of accuracy and the error values indicate that the land information system is suitable to carryout land clearance process. After ensuring the input data quality, it is necessary to find whether the system operates as required in the objectives. In order to check this, data from 10 applications submitted for UDA approval for various development proposals (i.e. for Hotel Projects, Residential, Recreational activities etc.) were fed to the system and the system results were compared with the decisions already arrived by the UDA through manual processing (Table 4-6). The identified accuracy checks that the system developed could produce the same decisions as of the manual operation.

6.3 System Benefits

Several benefits can be achieved by the introduction of the proposed system to Town and Country Planning. The system saves time, improves efficiency, encourages investors, by providing alternative site locations, acts quickly when supporting managing decisions, saves costs, easy extracting and easy access to data etc. are such benefits.

The system now in operation for processing an application takes a minimum of 40 days to complete, where as, from the proposed system it

can be done within a maximum duration of 5 days (Figure 5-9, Figure 5-10 & Table 5-8). Decisions for a majority number of applications, except for a few numbers of complicated ones, can be conveyed to the applicant instantly. This enables a discussion with the investor in finding alternatives for cases that could be rejected due to some reason.

In comparison with the present application processing system with proposed one, there are changed and unchanged categories. The table below indicates the advantages of the proposed system (Section 5.3).

Table 6-1 Comparisons of Application Processing Days

No	**Type of changed days**	**No. of unchanged category**	**No. of changed category**	**Advantage in No. of days**
01	05 – 0	-	2	10
02	03 – 0	-	1	03
03	02 – 0	-	4	08
04	01 – 0	-	9	09
05	02 - 02	1	-	-
06	01 – 01	2	-	-
07	0.5 – 0.5	2	-	-
Total		**5**	**16**	**30**

By analyzing the colleted data of various forms, the study has enabled additional information, which are very useful for decision-making. Since all these information are very closely related with development activities, its proper management would help to a well-balanced land development process.

6.4 Management of GeoLIS

The summary computations of land parcel information indicated that the majority of the buildings were used for residential purposes and were having just a single floor. Study of land parcel sizes indicated that the parcels having sizes between 11 m^2 - 250 m^2 and 400 m^2 – 750 m^2 consisted approximately 30 % each.

This ward had only 3 land zones gazetted by the UDA. In the study of floor distribution (Figure 5-4), use of buildings (Figure 5-5), and age of buildings (Figure 5-6) showed that in all these zones the distributions are similar. In case of number of parcels in each zone, the highest number falls within the range of (11 m^2 – 749 m^2). In case of the total extent, in all three zones, more than 50 % is with individual extents greater than 1000 m^2. These summary results show that the zoning in the gazetted under Urban Development Authority law No. 1090/13 dated 29th July 1999, needs to be evaluated for better land management.

The amount of staff will be reduced as the system minimizes the field visits and handling documentation. The applicants are not kept for a long time to get a decision. Quick decision-making character of the proposed system will ensure the completion of a good amount of work in a short period of time. A brief comparison of staff utilization against present number of staff is given in Table 6-2.

Table 6-2 Staff Reduction Comparison

No.	**Earlier System**	**Present System**
01	Director	Director and Computer Operator
02	Subject Clerk	
03	Cashier	
04	Deputy Director	
05	Planning Officer	
06	Thapol Clerk	
07	Typist	
08	Planning Committee (more than 4 officers)	