

**Vehicles Traffic Management and GIS Planning System
A Study of DETRAN Project -
Parana State /Brazil**

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PURPOSE:

The purpose of this work is to demonstrate the potential use of a Geographic Information System that will permit to elaborate several georeference thematic mapping and its application for vehicles traffic planning and management.

1. INTRODUCTION

The State Office of Public Safety through the State Vehicles Traffic Department, makes happen frequently careful and diligent search about car accident, drivers licenses issuing and further information concerned to Traffic Department, specific areas all over State of Parana.

The Research has been making using a special subjective way like filling applications, official reports and workshops in the Microregional Centers of Traffic, called CIRETRANS.

This method, consolidated by time, produces widely used by different Department and Institution which are connected by searching and interpreting knowlegede about traffic in State of Parana and all over the Country (Brazil).

To bring out the possibilities of increasing the research method of having information by developing proceeds and then a connection with a Geographic System Information, DETRAN, spread out a special key which will allow the way of approach into a data mechanism, that analyses and provide the elaboration several thematic maps.

The developing of this method was determinate from a careful searching of the inside necessities to obtain the final results. In fact to obtain the results DETRAN using information collected from its regional sections, collects monthly data researches about traffic, with good results. Recently, DETRAN, has been associated to a new program, which will allow obtain "on line" information, and that will open a new gate for creating a great solution for a very serious situation: the manual data research.

This new methodology will be able to access to factual information quickly, allowing this data will be promptly to understand and ready to be appreciated.

1.1: Localization area

DETRAN purpose is: to develop methodology using equipment already done in the institution, with the intention of making it rational for better results in the research.

(Fig. 1)



1.2 Studying area

This project covers the whole area of the State of Parana, in a total with its 371 municipal districts and 74 microregional traffic centers, and Curitiba, the capital of Parana's State, in particular. (Fig. 2.)



The project itself has some objectives produced by the original idea:

- collect georeference elements from traffic accidents on the mainly crossroads of Curitiba.
- to give support for interinstitutional integration in order to create information for public establishment and state system of information
- to do the first part for the beginning of the assistance of traffic planning by a monitoring in the most important cities of the Parana State
- to give supply as a disseminator instrument for the rising of new technologies for the CIRETRANS;
- to demonstrate and to show up the potential of to put into practice georeference program for people in general

2 METHODS AND MATERIAL

The project's purpose is the improvement of the whole State of Parana with strong equipment that will be capable to collect and give information by computers high tech already available and ready to be utilized in DETRAN and CIRETRANS.

- The systematic research about traffic situation was being done using microcomputers joined to a master network, settled in DETRAN and CELEPAR - Parana Eletronic Database Company.

The geographic information system developed by DETRAN intend to be the key opening chances to show the new work involving digital cartography and database acting together among several institutions of the Parana State government.

- a) The GIS developed by DETRAN has a distinguished character that means several possibilities of consulting to certain

geographic area and high speed access to database.

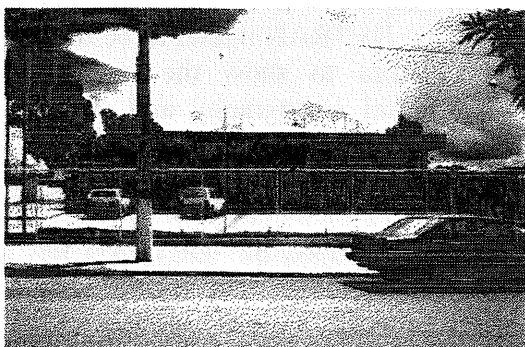
The most important characteristic of this process is the possibility to obtain serial information disposable by thematic mapping without special programs for its elaboration.

After having enough information about traffic register, the program brings up-to-date in the municipal data basis that encloses georeference information: name of the city, total accidents by statistic numbers, total of fleet and conductors, IPVA amount of taxes, mainly crossroads involving traffic accidents.

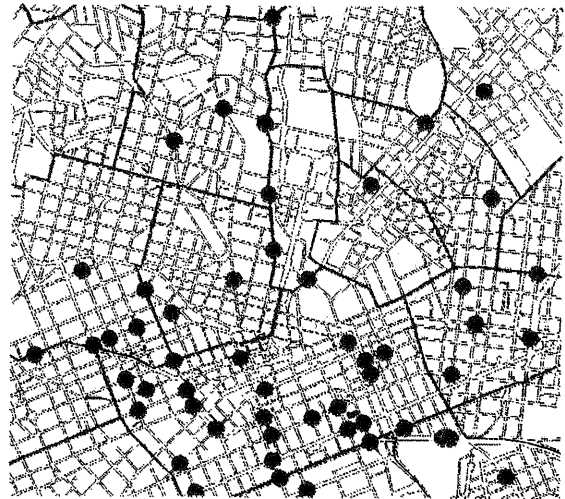
b) To obtain information from digital checking municipal sections, main streets and parkways from urbane area, federal highways and highways of the state for the exactly location of the researched area and its georeference.

c) utilization of pictures designed by the computer machine and its georeference using scanner from small images form, to help in the identification of the geolocalization point.

d) To obtain pictures of small format from CIRETRANS, traditional method was used and then scannerized by a HP 4c scanner planning and conversing digital maps reversing the parts of municipal areas, counties boundaires, federal highways and the highways of the state. (Fig.3).



Reversing of digital map of Curitiba, with entire design of the city: blocks, suburbs sections, municipal schools, mainly streets traffic accident areas, signal post and further information given by IPPUC. (Fig. 4).

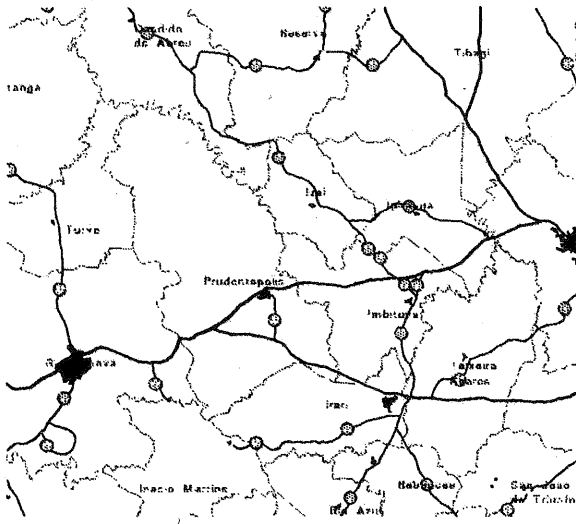


Development of new routines of working in order to obtain accuracy in DBASE III, to be used by Arcview 1.0 (ESRI,92).

To take into consideration that the project is nowadays developed by DETRAN through its technical coordinator(COTEC), the reversing to Arcview took place in a local social institution of the state called IPARDES with the valuable contribution in the reverse of the digital maps in CAD format into Arcview 1.0 format (ESRI, 92), employing for this project the software Arcinfo 7.4 (ESRI,92) and the procedure of the Dbase III (Ashton Tate,89).

This project will increase information already filled in DETRAN about statistics process that are available collected in specific formal documents in the past.

The digital maps of Brasil and municipal sections got from IPARDES and the maps of federal highways and the highways of the state, got into the Parana State Roads Department (DER), served as a referential status for the perfect areas identification and researched, developing a pretty new technology method that can be used by other states. (Fig.5.).



After the choice of the researched area, DETRAN will be responsible for georeference procedures information, that must be perfectly in accordance with its database.

3 RESULTS

The results from the project were very important for a better view and database reference in complements of several projects that are being developed by DETRAN.

The project, in the future, intend to complement also the Parana Public Database, together to the others systems that are available.

It will permit elaborate and spread out the

use of the information area training by georeference about traffic occurrence.

The project's and its creation in the CIRETRANS will be the leader for several works about vehicles traffic, because of the statement tradition DETRAN has as an official Vehicles Department of the State of Parana.

4 CONCLUSION

The realization of this project, will permit DETRAN able to check some special situations as:

- 1) The right number of municipal vehicles;
- 2) A wide open view of traffic mapping in most important cities of Parana;
- 3) The traffic system planning in the urban areas in several cities of the State;
- 4) Final diagnosis about traffic mapping in urban area of the main cities of the state
- 5) To contribute as a disseminator agent of the geographical information system technology and a special reference to traffic area data.

References and Literature

- BRASIL. Ministério do Exército, Diretoria do Serviço Geográfico. IBGE. Brasil Map, escale 1:7.000.000. Rio de Janeiro, RJ, Brazil, 1993
- IAP - Environmental Institute of Parana. Ortofotocartas do Cadastro Técnico Rural, Convênio IAP/GTZ, region of Foz do Iguaçu, escale 1:10.000, Curitiba, PR. Brazil, 1993.
- DER - Parana State Roads Department. Digital Maps of Federal and State Roads of Parana, Curitiba, PR. Brazil, 1995.

IPARDES - Institute of Social and Economic Development. Digital Maps fo Counties Boundaires of Parana. Parana Rural Program, BIRD, Curitiba, PR., Brazil, 1993.

DIAS JUNIOR, Celso Gonçalo. Introduction of GIS and Remote Sensing. Program Governmental School. IPARDES, UEL. Londrina and Curitiba. PR., Brazil, 1993.

IPPUC - Institute of Planning and Research Urban of Curitiba. Digital Maps of Suburbs, Blocks, Streets and principals crash points of traffic accidentes. Curitiba. PR. Brazil, 1995.