JNTUH COLLEGE OF ENGINEERING HYDERABAD (AUTONOMOUS)

KUKATPALLY, HYDERABAD – 500 085, TELANGANA STATE, INDIA

CENTRE OF EXCELLENCE - DISASTER MANAGEMENT (TEQIP-II) ADVERTISEMENT

Web : www.jntuhceh.ac.in Phone: +91-40 -23057787 E-mail : principal.ceh@jntuh.ac.in Fax : +91-40 -23057787

ADVERTISEMENT

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The vendors are requested to submit the details of their firms to the Principal JNTUH College of Engg, Kukatpally, Hyderabad on or before 11/04/2016, so as to send the invitations to their firm for the purchase of the software by meeting attached requirements.

Sd/-

PRINCIPAL

Accident investigation kit:

- STEP-1: BASE MAP GENERATION AND CHARACTERISTIC ANALYSIS ON ROAD NETWORK CHARACTERIZATION – PLANNING GIS

  Input:

  Map display system in reference to geo fence like latitudes and longitudes on the cadastral maps,/hand drawn maps, topo sheets, satellite data, bit maps. GIS features like overlay and integrated of raster / vector should be activated. Features like zooming, panning, attribute data attachments should be activated. RDMS should be interfaced. Module addition can be activated either in Windows/ Linux, programming interface should be JAVA, VC ++, VB or .NET.

  Network characterization can be carried out with nodes, links, paths and network. Delineation of the boundaries as defined either concentric intercepts or encircled spread should be activated. Gateway, transition nodes, general nodes should be distinguished and coded. Road widths should also be displayed.

  Module addition is related to :

- Heuristic algorithm for shortest path identification among the nodes of gateways, transition nodes and between nodes on selection.

- Node over lap, link overlap, path over lap should be identified.
- Quantification of nodes, links, path their distances, densities in the defined areas.
- Query analysis on spatial variation of network characterization with query of encircle or intercept variations like 0.5, 1, 2 etc..kms from defined center.
- Road functionality analysis should be conducted like road widthwise connectivity display

Outputs:

- Attribute tables enquired on
- Graphical plotting of paths, over laps
- Density plotting along the paths by adding the travel flows in attribute data
- Analysis view on similarity, continuity or discontinuity
- Road functionality will be displayed on hierarchy or non hierarchy.

Application at future times by researcher :

- Code will be extended to utilize on generating fractal model kit
- Code will be updated or edited and place it in e_Measurementbook getting used by professionals.

- Code will also be used to attach 3d coordinated and display view of tracking consistency or similarity.
- Physical model on urban mirror of city will be displayed

GIS package can be Open source/ commercial/ indigenous of intact features of GIS. Obligatory is that it should get interconnected with other GIS analyzers/architectures. It should be placed in combination or independent to function with central hall. It should be loaded in to e_measurement book. License control should not exist or low in price. Propose to manufacture/generate the product ofe_Measurement book with facilities of Range finder/scale interface/ Dimension interface, GPS, camera, Hardware for GIS Software and Other data structures. This system will work with LINUX or Windows. Cost of the e Measurement propose to activate is around Rs20,000 to 25,000/- including Hardware and software.

- STEP-2:DEFICIENCY ANALYSIS ON FUNCTIONALITY –RDP'S AND JUNCTION BASE MAP AS INPUT-SPATIAL FENCING – RELATIONAL GIS

Input: road development plan should be displayed in auto cad should be converted into latitude and longitude based display. Called them as spatially fenced map. All the features in junction like inscribed circle, exit entry radii, rotary, weaving widths etc will be checked up with Indian roads congress

specifications. These specifications will be given as input. Right of way specifications, road geometrics in reference to

Output: display of all the deficiencies in reference to the features and specifications.

Module addition: all the geometric shapes in reference to exit/ entry curve, median shapes etc are to be made as templates. Deficiency analysis and results are to be displayed in graphical form and attribute form.

Total process can be attempted in compatible RDBMS, Map display system either open source or commercial version. The same condition like the software code should be loaded in e_Measurememntbbok. Should be compatible for generations many more copies of GIS map display systems.

IRC codes on geometric specifications for Arterial and National Highways should be referred.

- STEP-3: MAPPING OF TEMPORAL OBLIGATORIES DUE TO TRAFFIC – VIDEOGRAPHIC BASED IMAGES ON TRAFFIC DYNAMICS ON RDP'S –OPERATIONAL GIS

Input: Videographic data or still photo data on roads referring to violations, illegal constructions, temporal occupations should be captured. GIS map display system should be integrated with video graphic data. They should be referred with latitude and longitude. Any identified obligatory should be converted into bit map. It should be made digitized and geo referenced.

Output: GIS Map display system with VIDEOGRAPHIC data be displayed on a small screen with a display on the road by a cursor representing the shooting movement. This map should be geofenced. All the obligatory issues to the traffic functionality should be displayed with in a geo referenced manner.

Module additions: integrating video graphic data with GIS map display system . tracking the features in shooting with geo referenced cursor on map or road development plan.

STEP-4:MAPPING OF VARIABLE VEHICLE CHARACTERISTICS WITH 9 DIFFERENT TEMPLATES -ENGINEERING DEFICIENCY ANALYSIS AT JUNCTIONS AND MID BLOCKS – DYNAMIC GIS

Input: map display system with spatially fenced display of junctions and roads with 3.5 *3.5 metres as block. All thenine templates like Geo fenced mapping of micro level features will be analyzed with templates like: turning path, sight triangle, stopping sight distance , vision template, glare recovery, acceleration, deceleration template, breaking distance, pedestrian walking distance template, etc---
Software interface for emitter, receiver and communication system of relevant are to interfaced graphically with standards of design and extreme conditions. Display of all the prevailing geometrics at mid block and junctions with latitudes and longitudes.

Output: All the negativity of the road user behavior on the road should be displayed. This output will recommend on

deficiencies in reference to planning, Engineering and management aspects of traffic control devices and bodies as supportive infrastructure.

Module additions will be related to nine templates, the standard specifications are drawn from IRC codes on geometrics, functional limitations for urban and regional roads. output will correlate thedriver attitude tracked from the GPS technology and proximity sensor technology. Technology output will give leads on driver reactions in reference to mobility like speed, acceleration, deceleration etc…

- STEP-5: ROAD USER DRIVING BEHAVIOUR - TRACKING WTH TECHNOLOGY INTERFACE – DIFFERENT TYPES OF COMMUNICATION , EMITTER AND RECEIVER SYSTEMS – TECHNOLOGY INTERFACED GIS

Input is from GPSemitter a signal of every one second should be tracked and connected to the geo referenced location of the vehicle. Software interface should also be connected to the Communication system like GSM/ GPRS. Receiver system emits the data of signal received from GPS should be connected to the Computer system having GIS map display. Software interface should be made to the Spatially fenced map of the road and create a data base on vehicle mobility display for every second.

Output: display of the vehicle mobility in a geofenced map. Software interfaced should also be compatible to the emitter

by other technology like RFID receiver/ proximity sensors. RDMS and display of features of mobility should be connected.

- STEP-6: INTEGRATING SPATIAL AND SPECTRAL CHARACTERSTICS EMITTED ON RIGHT OF WAY AT JUNCTIONS AND MID BLOCKS.DIFFERENTIAL VIEW WITH IDEALISTIC TEMPLATES – DISPLAY GIS

Input: specifications presented in code of practice of roads will be taken as input. This data will be placed in a proper RDMS and call in will be interfaced to display on map and display in attribute form. All the idealistic features of traffic control bodies like medians, channelizing islands, display of geometrics will be interfaced with actual features realized when vehicle is mobilized along the road with variable reactions.

Output: all the differentials are going tobe displayed under different trials made

with driver reaction times, speeds and vehicle interventions.

Module additions are tobe made for displaying the differential view

- STEP-7: TECHNOLOGY SET UPS, DATA BASE OF SPATIAL FENCED MAPS, INTERACE BETWEEN SERVER AT CENTRAL HALL AND PC TABLET OR SLAVE SYSTEM WILL BE INTEGRATED. VIOLATION RECORDED VEHICLES WILL BE FURTHER TRACKED WITH AN EXCLUSIVE GADGET OF

EITHER RFID OR GPS BASED SYSTEMS. PEDESTRIAN CLEARANCE WITH TECHNOLOGY WILL ALSO BE INTERFACED TO REDUCE RISK LEVELS – INTEGRATED GIS

Input: technology set ups outputs displayed in a system through USB/LAN interface/ RS232

Output and module addition:software interface to connect all the outputs and GIS architectures of concerned.

- STEP-8: GENERALIZED BASE MAPS OF GOOGLE,CADASTRAL, SATELLITE AND TOTAL STATION BASED MAPS WILL BE INTEGRATED AND TRACKING OF ACCIDENT INVESTIGATION PROCESS WIL BE GENERALIZED – WEB GIS

  Input: software interface made at different steps of accident investigation will be converted into web pages displaying as output.

  Output: spectral signature of the road in handling the accident analysis or act as record for reason the accident occurrence.

  Module addition: web page creation on communicating the accident analysis through a particular identity and a link which can connect to different analyzers and data schema of attribute and spatial features.

Urban flood analyzing kit

- STEP-1:MAPPING OF THE FEATURES ALL ALONG THE ROADS AND CATCHMENT AREA – GRID BASED INTERFACE – OPERATIONAL GIS

  Input: 3rd dimension along the road will be used to generate the catchment area boundary for the levels along the road. Boundary will be the point where the flow of water in transverse will be to the opposite side than to the directional flow unto the road. Grid of 0.5metre *0.5 metre will be taken to generate the base map for longitudinal and transverse directions of any main road recorded historically for urban floods.

Output: mapping of the 3rd dimension profile named as catchment area of a main urban arterial road with a longitudinal length for every 0.5 kms.

Module addition: software should be developed for 3rd dimension display, spatial gridding of 0.5metre* o.5metre and catchment area delineation for every 0.5kms in longitudinal direction along the main road. Display of built up areas, plan of

the plots, road geometric plans along the right of way for all minor roads connecting to the road should be displayed. GIS features should be activated in software interface.

- STEP-2:MAPPING OF PROFILE DEFICIENCY ANALYSIS ON INFRASTRUCTURE, SUPPORTIVE INFRASTRUCTURE – LONGITUDINAL AND TRANSTIONAL VIEW – RELATIONAL GIS

Input: geometric profile expected along the right of way features of urban arterial road and hierarchical roads should be displayed from the code of practice of urban roads. Total station data or spatial technology based data should be interfaced to the map display system.

Output: road and right of way features of arterial will be displayed in layer concept. 3rddimension , geometric deficiency and functional violations will be displayed.

Module addition: software interface of map display in a geo fenced and spatial fenced manner. GIS features of displaying should be activated on the study area. Graphical deficiency display with 2 dimension and three dimension should be displayed along the features of major and minor roads and their supportive infrastructure.

- STEP-3: MULTI COMBINATORIAL MAPPING OF IMPACT ANALYSIS ON TRAFFIC BY THE DEFICIENT PROFILES OF STEP-2- TECHNOLOGY INTERFACED GIS

Input: GPS interfaced vehicle mobility data will be connected to the road propose to study for urban floods. All the geometric and 3rd dimension features will be interfaced to the vehicle navigation technology.

Output: display of the congestion / delay profiles observed due to geometric, non functional and other road conditions.

Module addition: integration of GIS with GPS and Total station/ spatial technology data to the display of congestion profiles along the road. Display of vehicle mobility, two and three dimension profiles should be generated.

- STEP-4: 3D MAPPING OF CATCHMENT AREA WITH REFERENCE TO TERRAIN, TOPOGRAPHIC AT HIGH RESOLUTION. GEOMETRIC DISPLAY OF ALL FEATURES WITH IDEALISTIC VALUES – VIRTUAL GIS

  Input: cross slope, longitudinal slopes of the land, gradients and camber of the roads, geo gridding of the area of 0.5*0.5metres, geometric features of the infrastructure and supportive infrastructure will be stored in a RDMS.

  Output: Map display system with all the GIS features should be generated on the road of concerned. Virtual scenario of the study area delineated in the previous steps should be displayed.

Module addition: Software to display virtual view on the predefined areas along andacross the road and for study area in general. GIS features interface to the virtual display.

- STEP-5: PAVEMENT DETERIORATION MAPPING WITH THE INTERFACE OF STEP-1,2 AND 3-OVER LAY AND CORRELATIVE ANALYSIS –RECIPROCATIVE GIS

Input: pavement roughness condition, structural condition and surface condition of visual will be the input. In addition the vehicle mobility / delay profiles, 3rd dimension, two dimension display of features along the roads of interconnected should be interfaced. Further catchment area features will also be supportive to analyze the pavement failures.

Output: major pavement failures will be analyzed and mapped with leads on deterioration.

Module addition: software to correlate the pavement failures from the malfunction of geometrics, land use, topography and terrain conditions. GIS features should be activated.

- STEP-6: GRID BASED ANALYSIS - VIEW ON 3D MAPPING WITH REFERENCE TO OUTCOME OF STEP-5 AND UNDER IDEALISTIC CONDITIONS. TO IDENTIFY THE FEASIBLE LOCATIONS FOR water tanks AT PRELIMINARY LEVEL – DSS GIS

Input: idealistic gradients, geometrics and cross slopes will be interfaced to the roads. Low profile points among the multiple locations of rain harvesting pits will be displayed. Potential for rain harvesting pits and impedances will be interfaced.

Output: optimal locations of water tanks by method of moments setcovering or centre problem approach will be displayed. GIS interfaced virtual display will be generated.

Module addition: software, algorithms, model or objective function will be developed in GIS. Models like method of moments or setcovering or centre problem approach or any heuristic approach will be developed to identify water tanks.

- STEP-7: URBAN FLOOD IMPACT MAPPING WITH PREVAILING CONDITIONS OBSERVED IN ABOVE STEPS.TRANSITIONAL ANALYSIS AND MAPPING FOR OVERAGE OR DEFICIENCY MAPPING OF GEOMETRICS.LEAD OUT FOR QUICK DISPOSAL OF RAIN WATER- IMPACT ANALYSIS FOR FUTURE CHANGES – TRANSITIONAL GIS

Input: prevailing profiles of the catchment area/ study area, idealistic geometrics and deficient profiles for the defined roads in the study area and optimal locations of rain harvesting pits will be the lead giver for transitional GIS.

Output: optimal locations of Rain harvesting pits, storm water drain system network identification for quick disposal of rain

water and display of transitional changes of the features in the study area.

Module addition: virtual display of rain water flow due to changes in 3d profiles along the roads.

- STEP-8: MODELLING FOR OPTIMAL LOCATION OF RAIN HARVESTING PITS BY p-MEDIAN METHOD. MAPPING OF THESE LOCATIONS WITH EXISTING RAIN HARVESTING PITS OF INDEPENDENT HOUSES – MAPPING ANALYSIS OVER A SPACE AND TIME BASED WITH CAPACITY ORIENTATION OF RAIN HARVESTING PITS – ANALYTICAL GIS

Input: 3rd dimension and spatial distribution mapping of the rain harvesting pits.

Output: display of profiles among the rain harvesting pits. Lead generation for conducting deficiency view and corrections for quick disposal of rain water.

Module addition: software interface for rain harvesting pits networking in reference to urban road geometrics

- STEP-9: INTEGRATING DIFFERENT OUTCOMES OF THE ABOVE GIS ARCHITECTURES FOR ONLINE MONITORING ON WORK OUTCOME OF INFRSASTRUCTURE CONSTRUCTION AND ITS COMPATBILITY TO TRAFFIC –INTEGRATED GIS

Input: GIS analyzers will be integrated with their outcomes. This input will be critical data base for planning and engineering issues on infrastructure development

Output: virtual display system in GIS with a simulating display of urban flood on infrastructure and study area.

Module addition: software interface to connect technology, GIS analyzers and display system of online monitoring of urban flood impact in view of regular overlay of bitumen surface on main roads

3rd dimension lead making kit on flash floods.

- STEP-1: DEVELOPMENT OF 3D MAPPING ON THE CATCHMENT AREA.INTEGRATING WITH LOCAL MAPS, SATELLITE DATA AND GOOGLE MAPS – OPERATIONAL GIS.

  Input: 3rd dimension coordinates of the study area with reference to submergible point of the main regional highway.

  Output: catchment area identification to track the most submergible villages when the flash flood increases at the obligatory points.

  Module addition: software to integrate all the relevant data procured from spatial technologies to generate 3D mapping

- STEP-2: MICRO LEVEL CATCHMENT AREA MAPPING – 3D VERSION – GRID BASED APPROACH OF 1METRE*1METRE. LAND USE MAPPING, TERRAIN AND TOPOGRAPHICAL MAPPING WILL BE CARRIED OUT – VIRTUAL GIS.

  Input: coordinates of all types of land use, 3rd dimension values among the grids of the catchment area and general terrain values.

  Output: virtual mapping of the study area at micro level. Display of two dimensional and three dimensional features in the study area with reference to lowest elevation point along floods converge point .

  Module addition: software to display grid based mapping at micro level. Display of 3rd dimension impact on floods on study area.

- STEP-3: DEVELOPMENT OF ALERT SYSTEM WITH GSM/OR COMMUNICATION SYSTEM OF RELEVANT. INTERFACING TO CENTRAL HALL THROUGH GIS AND TECHNOLOGY. – TECHNLOLOGY INTERFACED GIS

  Input: latitude and longitude of the alert system with a map of the features of catchment area.

  Output: buzzer or alert display at central hall.

  Module addition: GIS Map display with alert system location, buzzer display at central hall, software interface for receiver on the map.

- STEP-4: MONITORING OF DYNAMIC CHARACTERISTICS OF WATER LEVELS THROUGH TECHNOLOGY. GIS BASED MAPPING OF ALL DYNAMIC CHANGES OF WATER LEVEL OVER A TIME AND SPACE- MONITORING GIS

  Input: sensor display / communication of change of levels of water during floods.

  Output: 3rd dimension mapping of the catchment area with a display of water level at flash flood point in the study area.

  Module addition: software to interface flood growth monitored through sensors. Display of the characteristic view of catchment area of 3rd dimension in reference to flash floodlevel.

- STEP-5: CATCHMENT AREA MAPPING WITH ALL RELEVANT LAND USE, NETWORK, TOPOGRAPHICAL, TERRAIN FEATURES. TECHNOLOGY INTERFACE BETWEEN EMITTER AND RECEIVER FOR HELP CALL WITH GIS AS INTERFACE – PROTECTIVE GIS

  Input: 3rd dimension profiles in the study area. Help call signal to the receiver sat predefined locations.

  Output: buzzer at defined locations

  Module addition: software interface for GIS map display, location display of help call and inter connectivity to central hall.

- STEP-6:INTEGRATED SETUP OF WATER LEVEL TRACKING WITH ALERT SYSTEM, GUIDANCE TO RESCUE OPERATOR, VICTIM HELP CALL SYSTEM ON GIS WITH 3D MAPPING OF STUDY AREA. ONLINE MONITORING AND MAPPING BASED ALERT SYSTEM – INTEGRATED GIS

  Input: 3rd dimension profile of the ground, water flow distributions at different locations and help call location.

  Output: route guidance for different locations from defined points of rescue operations

  Module addition: interface for GIS display and communication correlation if exists between rescue operator and victim. General route guidance for rescue operator in reference to ground, water profiles and other land use details.