

Urban Systems Ltd.

Harnessing GIS Technology in Transportation Planning

December 2004



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USE OF GIS

- We have used GIS for a variety of transportation planning and engineering exercises
- Specifically USL has worked with a number of communities for:
 - ❖ Roadway Capital
 - ❖ Roadway Rehabilitation
- Recent examples include:
 - ❖ City of Kamloops TravelSmart Plan
 - ❖ Corporation of Delta Sidewalk Assessment and Implementation Strategy



TRAVELSMART

City of Kamloops

TravelSmart -
Integrated Land Use
and Transportation
Plan



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TRAVELSMART BACKGROUND

- City had experienced considerable growth
- Demands being placed on the transportation network
- Desire to retain mobility in the future
- Integrate land use planning with transportation planning



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TRAVELSMART OBJECTIVES

- Develop an integrated land use and transportation strategy
- Provide clear direction for updating land use planning policies in the OCP
- Prepare a transportation plan which embraces all modes of travel, realistic mobility targets, affordability and addresses TDM
- Ensure environmental, economic development and quality of life goals are taken into account



PROJECT PHASES

- Phase 1 - program direction and guiding principles
- Phase 2 - data gathering and transportation model development
- Phase 3 - land use and transportation scenarios
- Phase 4 - integrated land use and transportation strategy

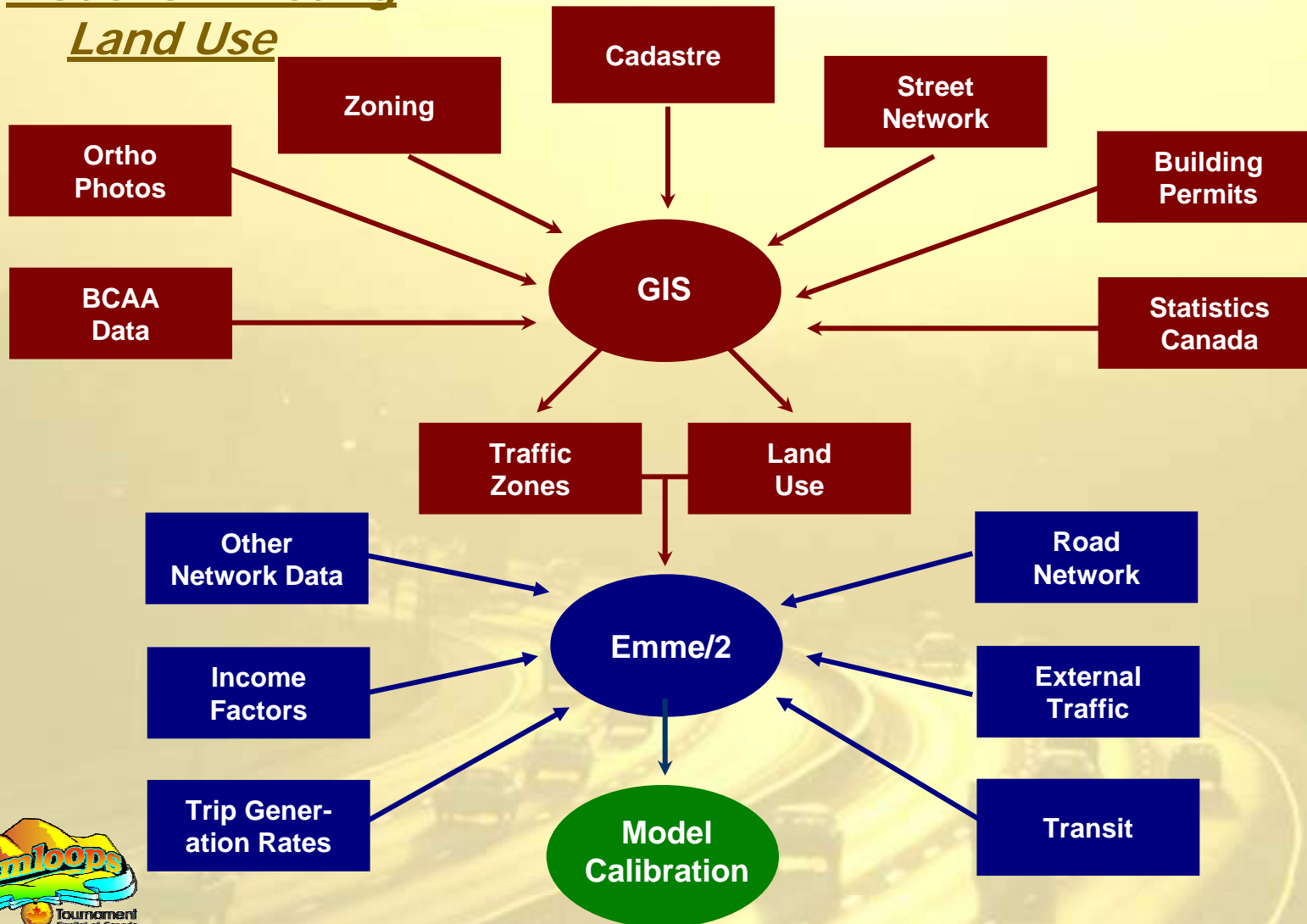


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TECHNICAL METHODOLOGY

Model of Existing Land Use

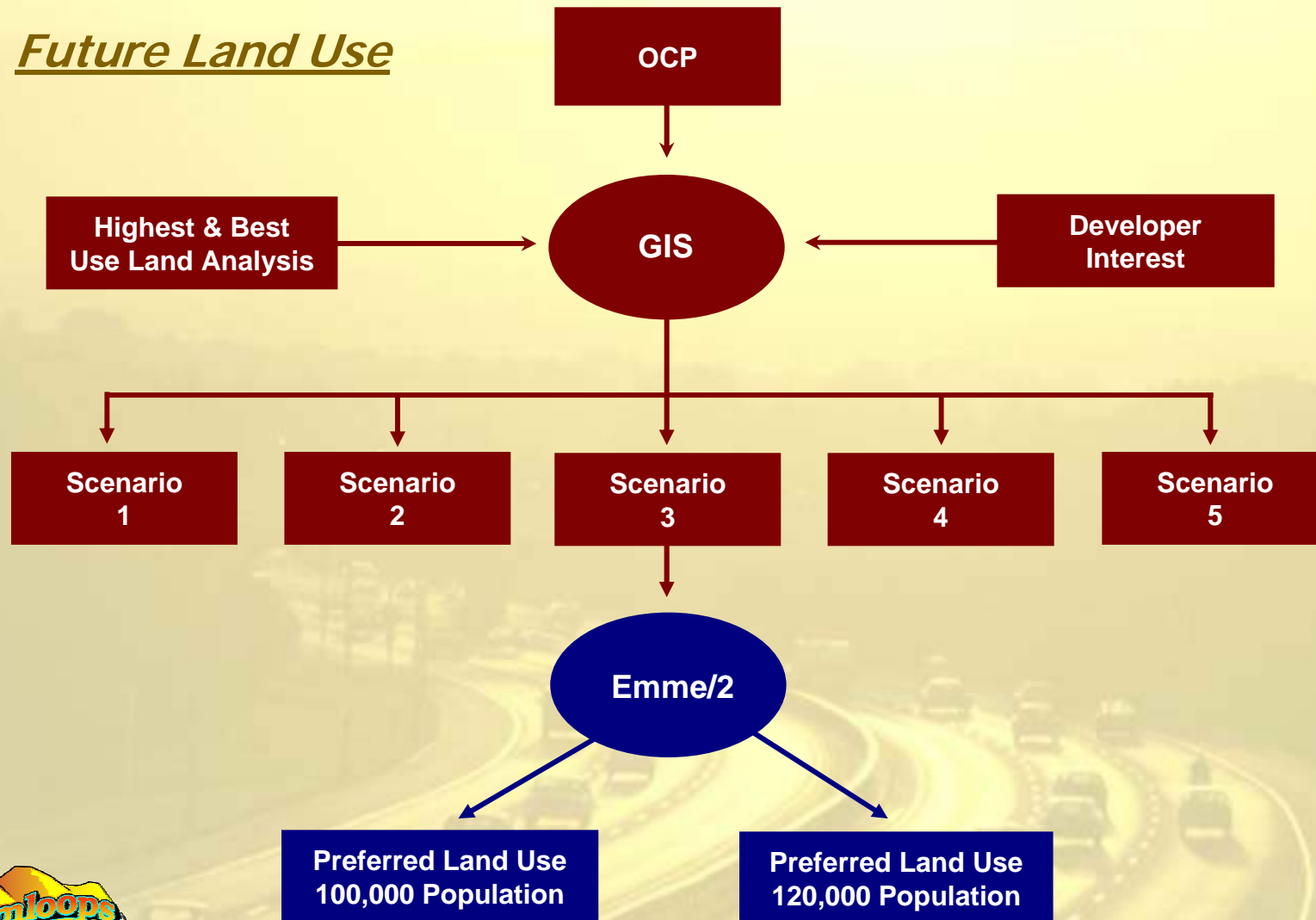


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TECHNICAL METHODOLOGY

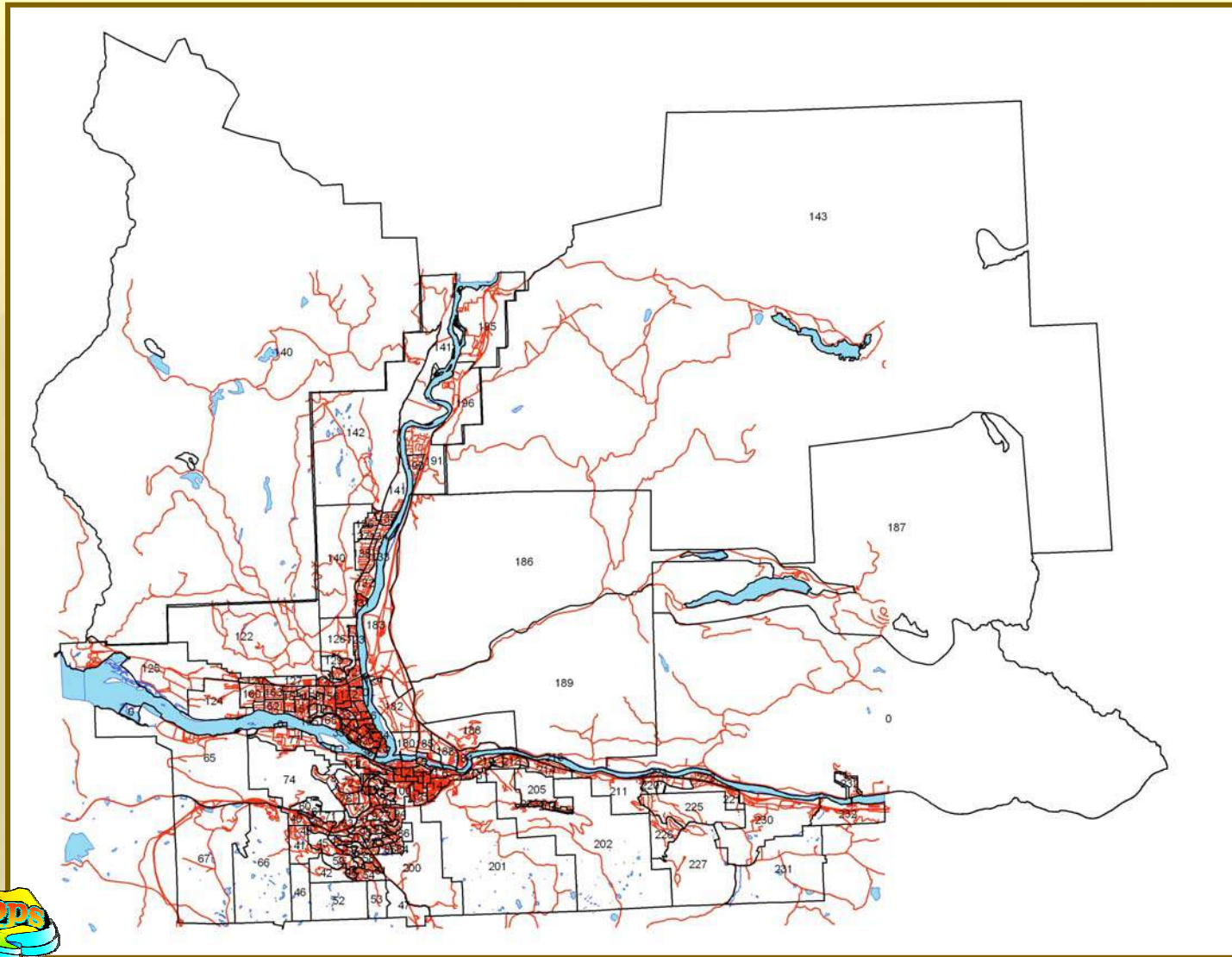
Future Land Use



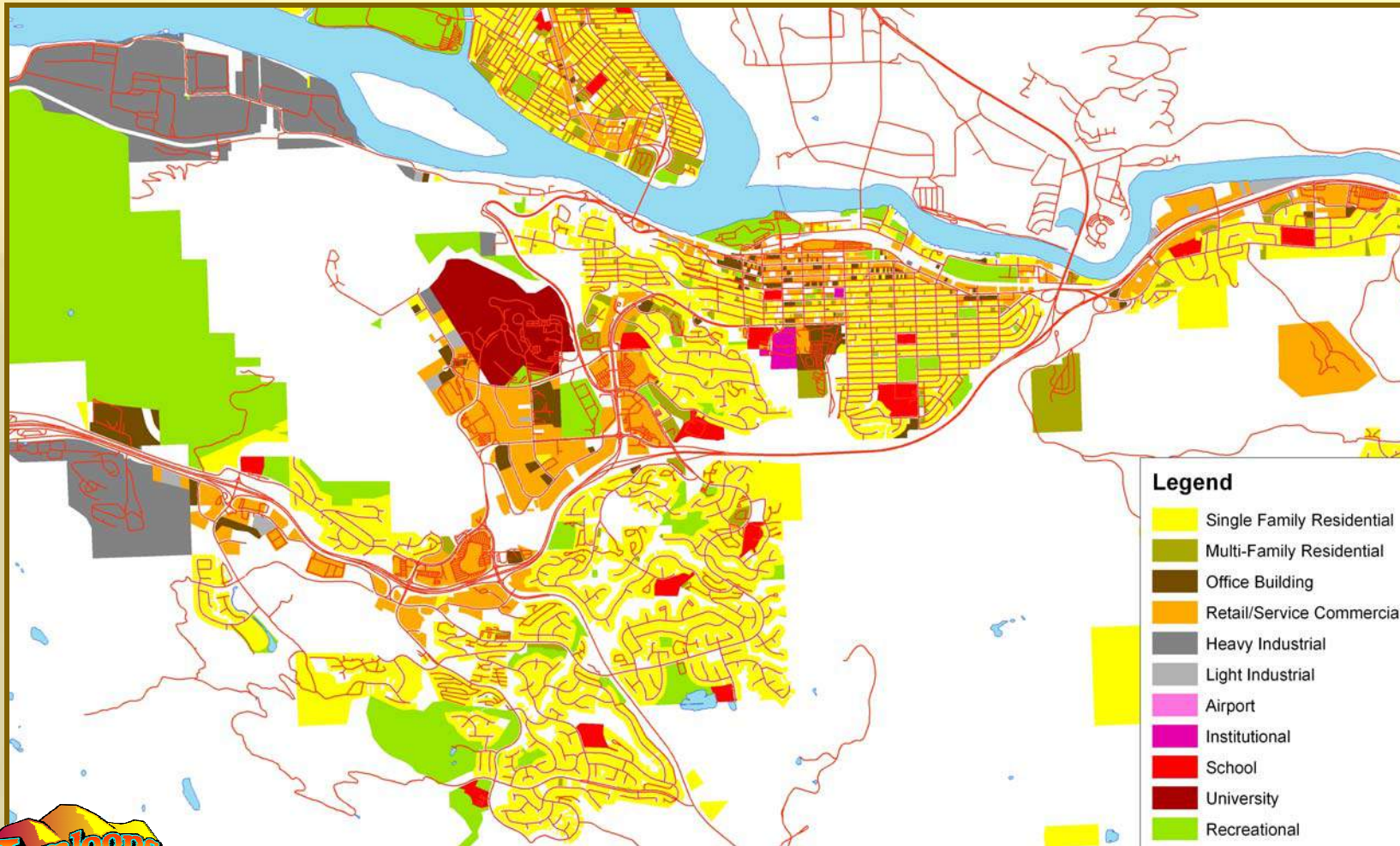
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TRAFFIC ZONES



LAND USE MAP



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CHALLENGES

- **BCAA does not have up-to-date information on all properties**
- **Finding the number of residential units in multi-family dwellings**
- **Getting all data to the property level**
- **Generating the right land use data for each property**



ADVANTAGES OF GIS

- Ability to collect, store, and analyze data from a number of sources
- Ability to do building area calculations from ortho photos
- Ability to visualize data to search for inaccuracies
- Easier start up for updates
- Assisted in developing highest and best land use for future development
- Ability to use for other projects (i.e. water model)
- Easier response to evolving issues



RESULTS

- **Able to reduce list of needed road improvements from \$120 M to \$14 M without compromising mobility**
- **Significantly changed future growth in OCP**
- **Has spurred action on other transportation planning/engineering exercises such as TDM for the Hospital, Bike Master Plan, Pedestrian Master Plan**
- **Now have a tool that can respond to changes in land use philosophy**



NEXT STEPS

- Yearly updates of land use data
- Potential total model update in next couple of years





Corporation of Delta

**SIDEWALK ASSESSMENT
& IMPLEMENTATION
STRATEGY**

GIS METHODOLOGY

*Craig Polzen
GIS Specialist
URBAN SYSTEMS LTD.*



BACKGROUND

Delta Sidewalk Assessment Project

- **advance sidewalk construction** throughout the community in a systematic and objective manner.
- **implementation priorities** developed through this assignment will be used by Delta staff to **develop future capital plans.**



OBJECTIVES

- **Identify sidewalk needs** within Delta to achieve current standards along various classes of roadways and in key pedestrian areas;
- **Establish priorities for the implementation** of sidewalks based on locally-defined criteria such as safety, demand and overall contribution to the existing network of sidewalks;
- **Identify improvement options** and associated costs for alternative treatments;
- **Prepare an implementation strategy** that identifies short-term, medium-term and long-term priorities.



ASSESSMENT CRITERIA

- **Pedestrian Generators** (proximity rating)
- **Safe Routes** (based on Delta's 'Safe Routes to School' Program)
- **Transit Stops** (proximity rating)
- **Roadway Class** (based on Delta's rating)
- **Traffic Volume** (based on Delta's Research)
- **Posted Speed** (based on Delta's rating)
- **Network Contribution** (based on spatial evaluation)



ASSESSMENT CRITERIA

1. Pedestrian Generators

Derived from: Zoning, Field Visits, Phone Book/Internet Searches

Community Shopping Areas
Highway Commercial Zones
Shopping Mall/Plaza
Local Commercial Zones
Major Office Buildings
Major Parks
Neighbourhood Parks
Recreation Centres
Secondary Schools
Seniors' Homes
Places of Worship
Industrial Sites
Hospital/Health Centre

Proximity Analysis:

0-250 m

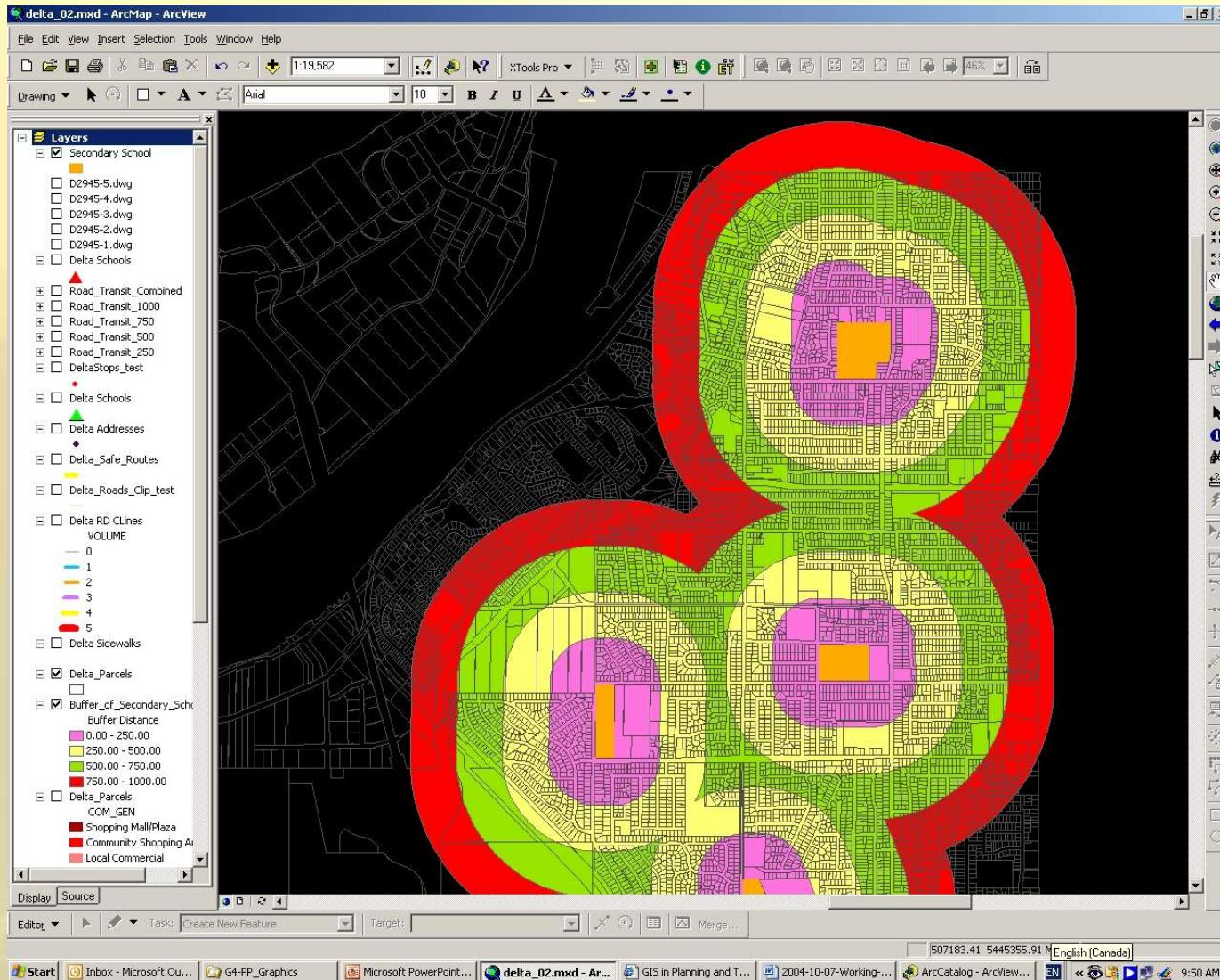
250-500 m

500-750 m

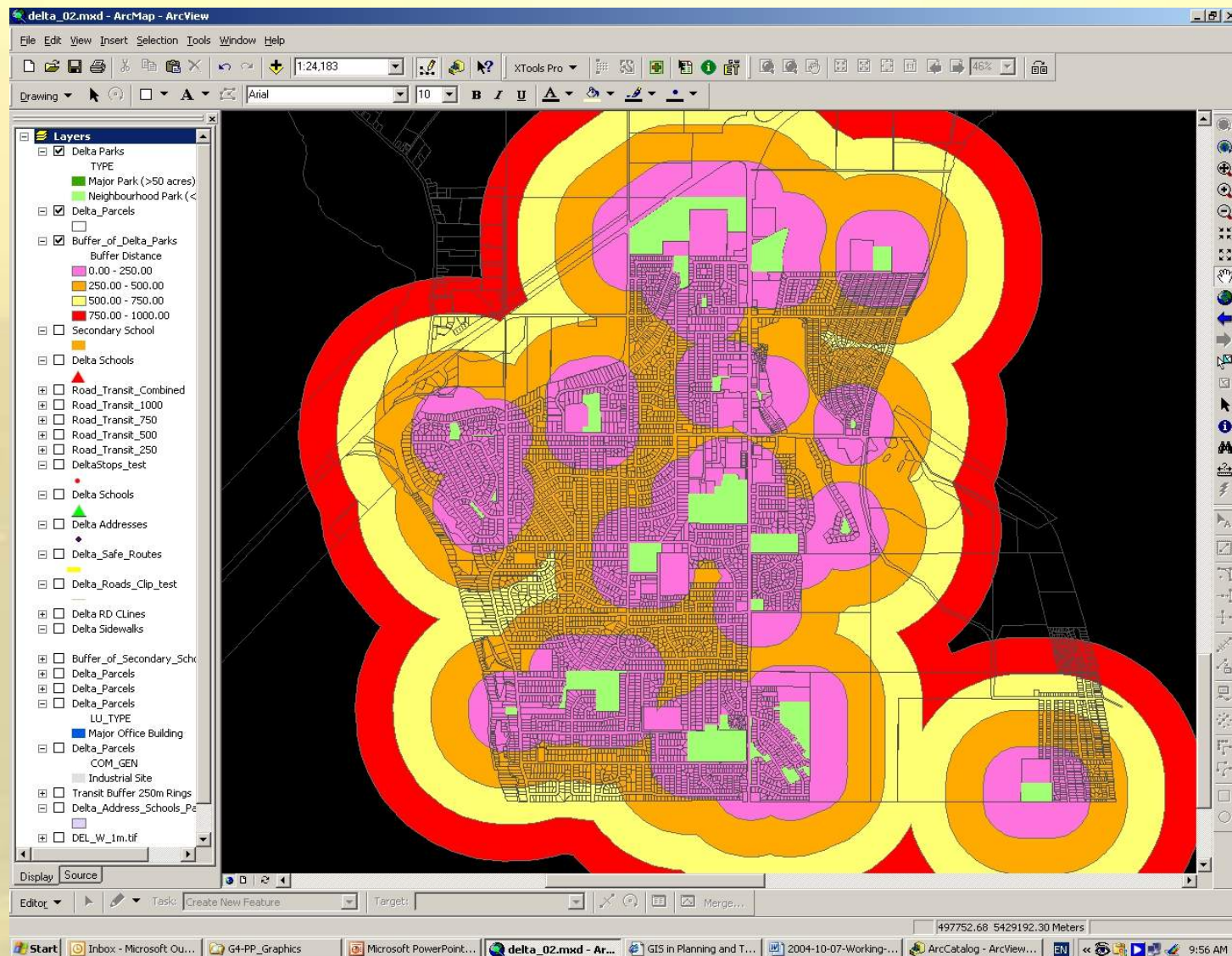
750-1000 m



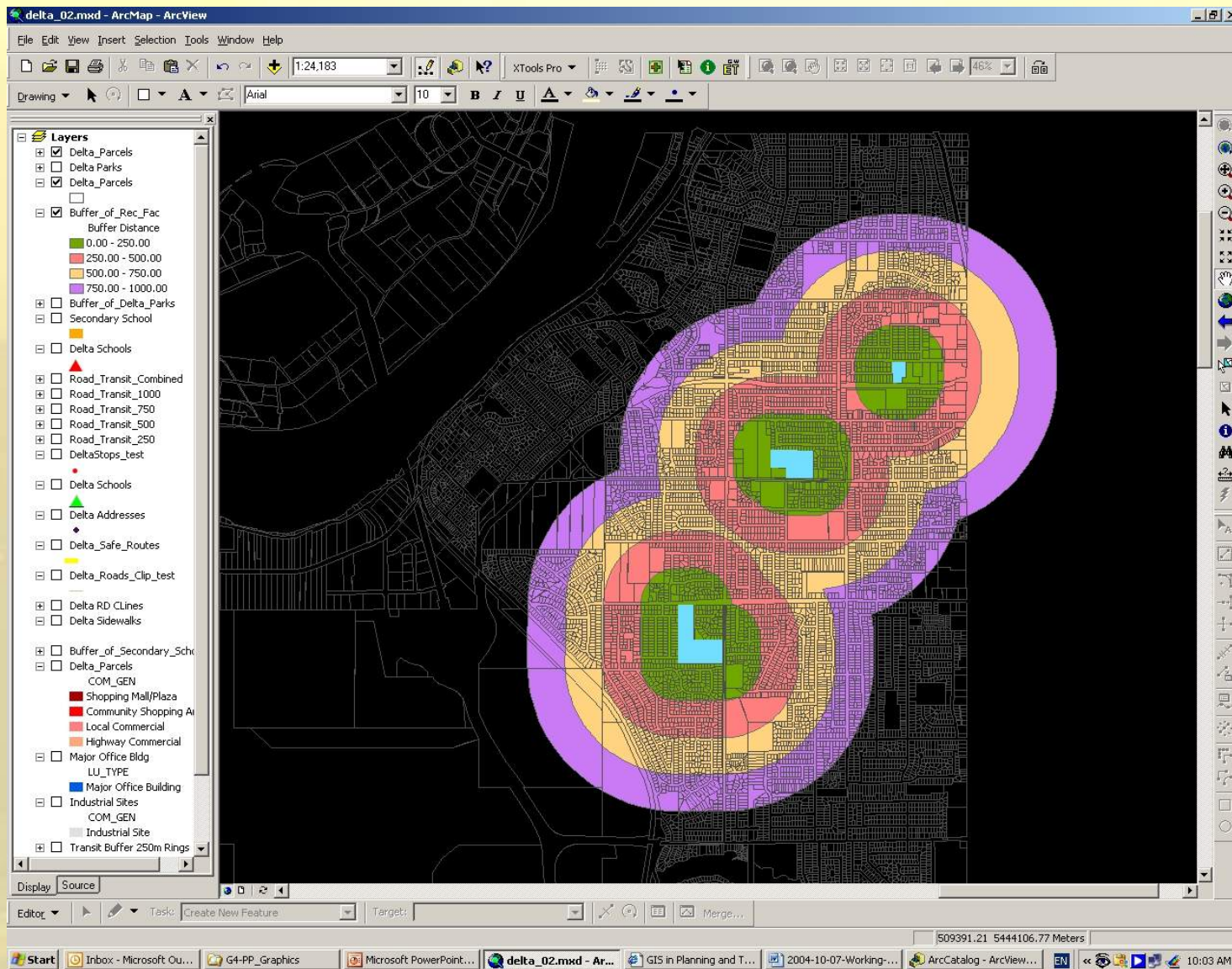
SECONDARY SCHOOL BUFFERS

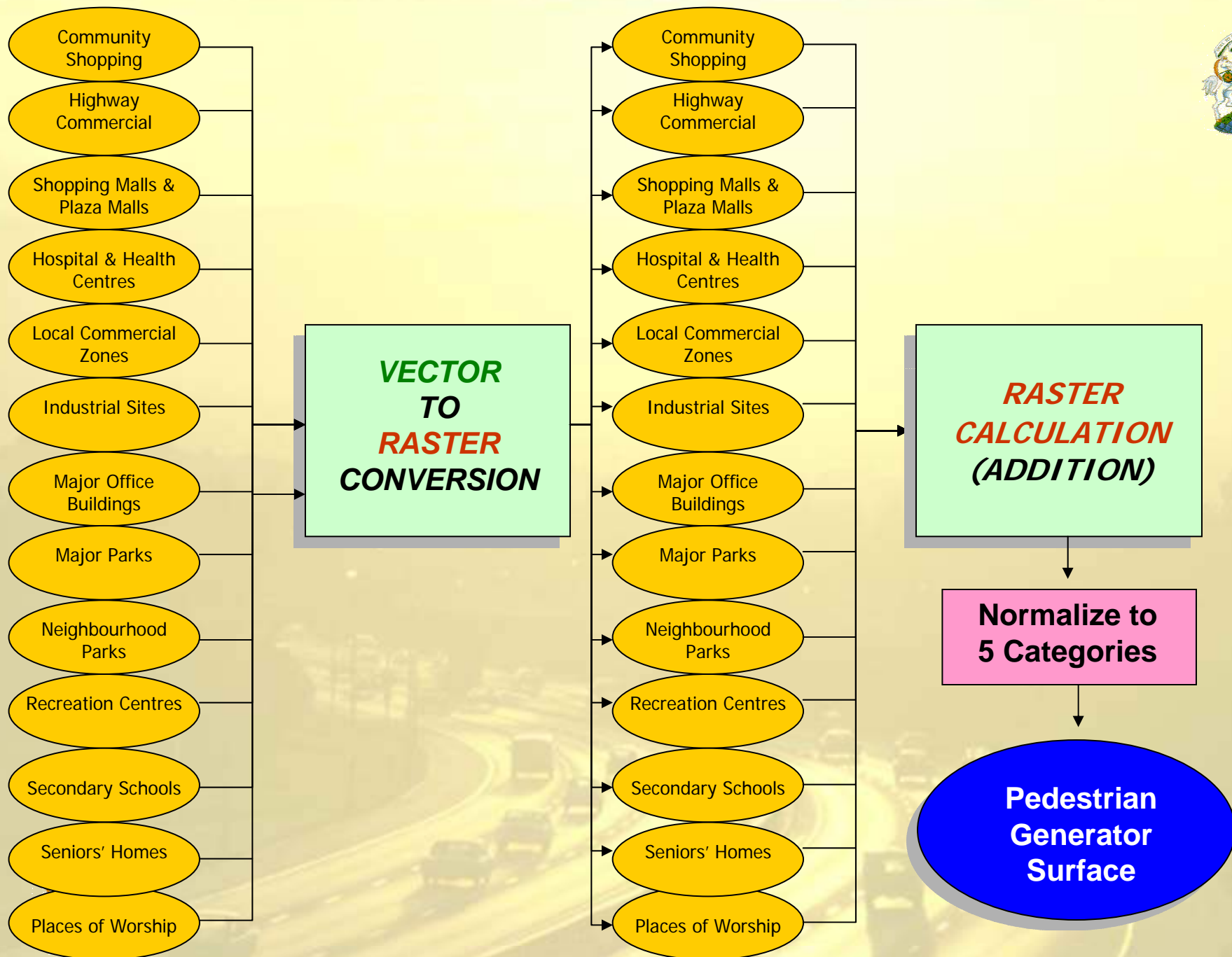


NEIGHBOURHOOD PARK BUFFERS

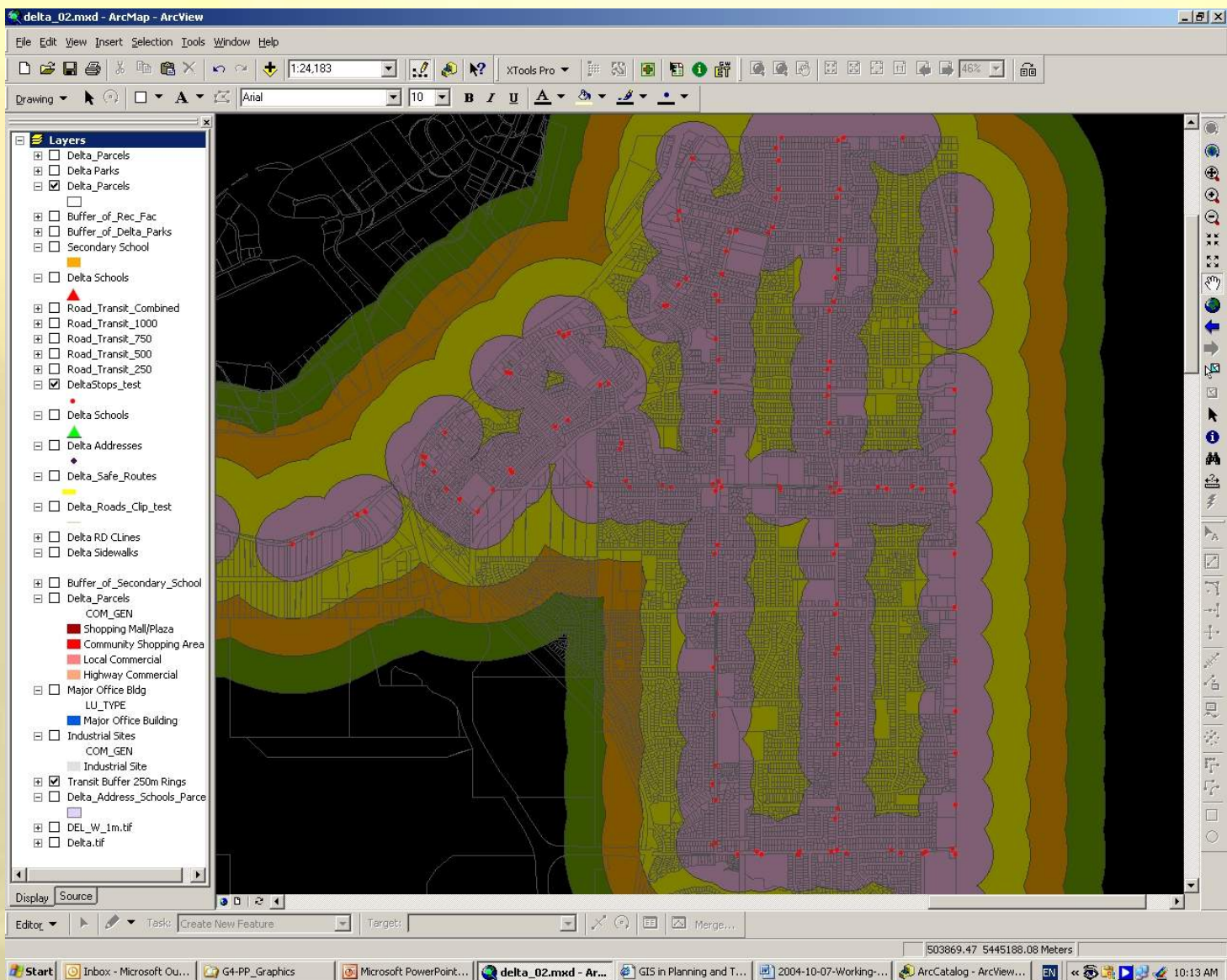


RECREATION CENTRE BUFFERS

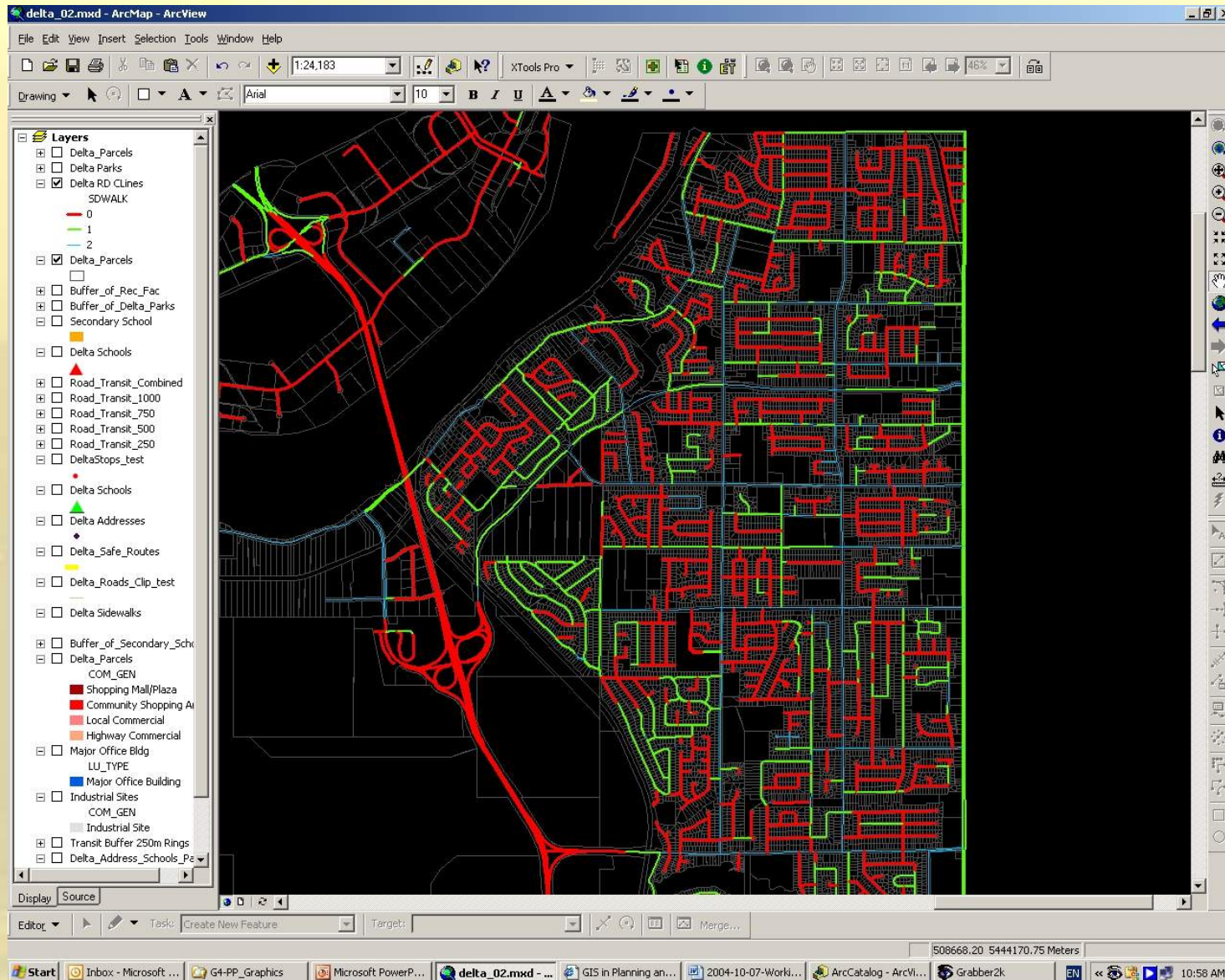




TRANSIT STOP BUFFERS



ROAD CENTERLINE DATA



ROAD CENTRELINE ATTRIBUTES

- **Sidewalk Rating** – centreline clipped by technician based on sidewalk dataset
- **Transit Stop/Pedestrian Generator** – assigned by spatial selection
- **All other attributes** - assigned by technician to segments of road centreline dataset

Sidewalk Rating	Safe Routes to School	Road Class	Traffic Volume	Posted Speed	Network Contribution	Transit Stop	Pedestrian Generator
0	1	5	4	3	2	4	3
1	2	3	5	3	2	5	4
2	2	2	4	4	4	2	5



Road
Centreline
Layer

Intersect

Pedestrian
Generator
Layer

Road Centreline
Layer w/ Ped.
Gen.

Final Road
Centreline
Layer

Intersect

Transit
Proximity
Layer

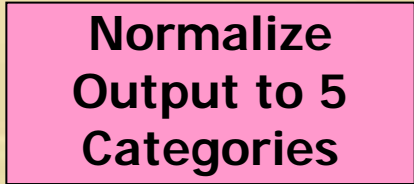
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Raw Attribute Data



Totalled Raw Attribute Data



Normalized Data Results



SUMMARY

Sidewalk Prioritization Strategy

- **Priority Rating** of 1 to 5 from GIS Analysis
- **Implementation Options** with Associated Costs



QUESTIONS?



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