

The Development of Re-lytics, an Application Isolating Tenant Opportunity in Grocer-Anchored Shopping Centers and a Comparative Analysis of the Competitive Environment Datasets Used During the Evolution of the Re-Lytics Application

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Keywords: GIS, Commercial Real Estate Analytics, Grocer-Anchored Shopping Centers, Trade Area, Competitive Environment, Tenant Opportunities, Site Selection

Abstract

A Geographic Information Systems (GIS) based real estate leasing application was used to isolate tenant opportunities at the Prairieview Shopping Center located in Eden Prairie, Minnesota. The study used data collected by the owner of the center, United Properties Investments (September 19, 2009). Data created and utilized in the analysis were part of a GIS-based application known as Re-lytics, which combines market survey, demographic, consumer expenditure, and supply and demand data to formulate marketing plans focused on optimizing occupancy and tenant synergies at grocer-anchored shopping centers. An index providing a relative context of retail concept value to the grocer-anchored center is the basis of the Re-lytics application. The Eden Prairie trade area analysis was the first study completed using these methods and highlights inefficiencies that were previously incorporated during the evolution of the Re-lytics application. The results identified a targeted list of Tenant Types that were absent or have little presence in the trade area based on a field survey of the competitive environment. A comparison of the datasets analyzed during the evolution of the application is discussed highlighting the importance of accurate base data.

Introduction

United Properties Investments (UPI), a Bloomington, Minnesota based Real Estate Operating Company (REOC), has been a successful investor in commercial real estate for nearly a century. UPI focuses on many aspects of commercial real estate, including development and investments. UPI owns 18 grocer-anchored retail shopping centers, primarily in the Midwest, with new centers being acquired throughout other areas of the United States. Growth and

expansion into new areas of the U.S. dictates a greater need to assess existing competitive environments in these locations. This has become a difficult task as in-depth local knowledge is needed for key decision making strategies. As the portfolio expands, familiarity of retail shopping centers in other markets by management teams is pivotal. As the UPI portfolio has increased, the need for accurate spatial data has grown dramatically. The commercial real estate industry depends almost entirely on location for its

success (Mendes and Themido, 2004). The same can be said of the spatial data that is representing the location of real estate.

Today's commercial real estate decision makers are inundated with analytical tools that provide statistics and metrics on everything from baby boomer densities to the amount of shampoo sold in an area. Not having enough data is typically not a problem for a decision maker. Instead the problem is in knowing what the data means and having confidence that sound methods were used to produce it. As a result decision makers are overcome by what is referred to as the "Paralysis of Analysis (Lenz and Lyles, 1985)." This occurs when too much data is incorporated into the process with unknown accuracies and methods from which people are attempting to base their business decisions upon (Edmunds and Morris, 2000). If one cannot make enough sense of data to formulate a plan it is useless.

These factors led UPI, along with its sister company Northmarq, to invest in the development of Re-lytics. Re-lytics incorporates data from many sources to deliver a clear and actionable marketing plan. The audience includes brokers, asset managers and investors who need accurate, current data of existing conditions of their centers of interest.

The base components of the Re-lytics application are accurate tenant information and the Categorical Index (CI) which is an index providing context to the data. Though other data are used in the Re-lytics application only the CI and base data are discussed at the request of UPI. Collection of the Base Dataset and its spatial accuracy in comparison to datasets previously used

by UPI is assessed. Finally, the CI is applied to all datasets in the analysis and the outcomes of each dataset on target marketing plans are discussed.

The focus of this paper is on the base data of Re-lytics which serves as the foundation of the application. Without the aid of modeling or advanced algorithms, accurate data, coupled with basic contextual indexing, has provided simple and logical outcomes with proven success. As one unnamed author posted on a analytical modeling webpage, "Complexity comes free. It's simplicity you have to work for (Dark Matter, 2004)." Much work has gone into this application with the overall goal of producing a simple plan which is the by-product of a plethora of complex analyses.

The Evolution of Re-lytics

Commercial real estate has long been a business based on intuition guided by experience and common sense (Bennison and Hernandez, 2000). GIS-based solutions for the real estate industry have been present for several years. However few products ever provide the end user with what they really need, a plan.

Beginning in 2007, Re-lytics began to take shape. Since that time the analysis employed and the tools used to facilitate Re-lytics have completely changed. Initially, the analysis involved researching the competitive environment and supplementing the findings with basic demographics. Much information could be extrapolated from this data set; however, only partial comprehension of what was actually happening could be determined due to inaccurate data and spatial variance of consumer behavior. Additionally, the analytical products

were often only legible by GIS staff that often lacked the necessary knowledge of real estate to take appropriate action.

In these early days the majority of the analyses were completed using Mapinfo 9.0. Competitive environments (tenants present) were determined by third party data providers and no context was provided to help with the interpretation of the data. This meant that if someone had no wisdom of experience in the grocery anchored retail tenant sector, they could not explain to a prospective tenant why this location was a good fit for them. Trade areas, or the geography from which customers are drawn from, were delineated using methods that in time were found to be grossly inaccurate. Supplemental data, such as demographics reports, were conducted on an as-needed basis for each shopping center and the data generated were not centrally stored. This led to much unnecessary repetition and duplication in the analysis process and a failure to formalize the learning.

Re-lytics has evolved substantially in the subsequent two years. During this time many retail analytics systems and models were being assessed by UPI. After much analysis UPI decided to develop their own system based upon combining informal knowledge and expertise with precision data. The refined purpose of the application is to provide users with 15 minutes of tactical knowledge that is easily understood and accessible that addresses underserved demand and existing sub optimal tenant locations.

Previous to this application, third party data vendors were used to gather specific business location data. Now UPI uses field verified data instead of having to hope that the data being used was correct. Instead of having one technician

complete all of the analytical work, often replicating many other analyses, the process is now automated and centrally served through ArcServer. Field verified data are entered into the application which automatically joins the data to the CI. No verification or “scrubbing” of the attribute data is necessary as domains have been created for the field analyst entry database so that only predefined values can be entered. Support materials that provide insight into consumers and their habits supplement the competitive environment analysis. These support materials grew from simple demographic reports to include:

- 1) consumer expenditures outlining how consumers within a definite boundary dispense their income;
- 2) quarterly updated demographics;
- 3) supply and demand analyses comparing the dollar amount of goods sold in a given area to the amount spent by people within the same area;
- 4) consumer lifestyle reports;
- 5) traffic counts;
- 6) commute and laborshed analyses which provide insight into daily traffic dynamics and origins/destinations;
- 7) photographs of the physical condition and visibility of tenants from main thoroughfares to aid in context; and
- 8) actionable market analysis reports which summarize the listed materials and lay out conclusions on the market

All of these materials are centrally stored and can be accessed by clicking on the tenant space in the online map interface. Re-lytics uses Microsoft SQL server 2005 which is fed through ArcSDE into the ArcServer application. Additionally, the web interface is Silverlight 3.0 which utilizes the

Silverlight API running in an ASP.NET 3.0 site. These provide the end user with a simple, fast, and comprehensible application to retrieve relevant data and produce presentation grade visuals for perspective clients.

Creation of a Categorical Index

The CI was created to formalize informal knowledge. Many models have been built attempting to do just this, although few have had the accuracy or geographical specificity that this model provides. The CI served as the foundation for collecting and analyzing data so that retailers could be quantified and qualified relative to the type of retailers that were typically present in grocery anchored centers. Consumers coming to shop at the peripheral shops of a large grocer anchored shopping center are attracted primarily by the large grocer (Hardwick, 2003). While the entire concept of the shopping center is based upon this fact, few analyses available at the commercial level today incorporate the importance of tenant types relative to the type of shopping center in their logic.

The CI was developed using simple database theory coupled with years of experience and intuition of senior development staff at UPI and guidance from the Center for Community and Economic Development (Wise, 2008).

The CI includes 135 types of retailers and is based on the North American Industrial Classification System (NAICS). The Federal Office of Management and Budget (OMB) assign the NAICS code to each legitimate business establishment. The purpose of the NAICS code is for statistical analysis of business patterns to aid in determining

the health of the economy (US Census Bureau, 2009).

The CI generally follows the same codes as the NAICS. However, some codes were altered to provide a more granular level of detail. For certain concepts of retailers, including fast food, additional qualifiers were added to the code. For other concepts codes were generalized to simplify the system. In the case of fast food retailers the NAICS system categorizes all fast food with the code 722211. This means a Caribou Coffee was categorized in the same manner as a McDonalds or a Leann Chin’s. Since these concepts are not direct competitors, alterations were necessary to differentiate the retailers in the CI. To fix this, the NAICS codes were revised to reflect the concept of the fast food retailer so they could be individually quantified in the analysis as can be seen in Table 1 below.

Table 1. Example of CI sub-coding.

New NAICS	Food Type
722211As	QSR Asian
722211Ba	QSR Bagels
722211BB	QSR BBQ
722211Bu	QSR Burgers
722211Ch	QSR Chicken
722211Co	QSR Coffee
722211De	QSR Deli
722211Et	QSR Ethnic – other
722211Ic	QSR ice cream
722211Me	QSR Mexican
722211Pi	QSR Pizza
722211Sa	QSR Sandwich / Subs

Note: QSR is an industry term meaning Quick Service Restaurant

Alternatively, some codes were grouped as their individual relevance to the shopping center was minimal or their concept did not differ greatly from

another. An example of this is Pet Supplies and Pet Grooming, which previously had two separate NAICS codes but were combined to simplify the index.

In addition to the NAICS qualifier, three other columns exist within the index being:

- 1) Priority – Ranked A through C, based upon the relative importance of the concept within a given group.
- 2) Demand – Qualifies the type of goods provided by the concept.
 - a. Convenience
 - b. Intermediate
 - c. Professional Services and
 - d. Shopper’s Goods
- 3) Group – This category groups specific concepts of retailers by relevance.
 - a. 1 - Traffic Generators
 - b. 2 - Convenience Retail
 - c. 3 - Personal Services
 - d. 4 - Food Service
 - e. 5 - Financial Services
 - f. 6 - Medical
 - g. 7 - Professional Services
 - h. 8 - Civic
 - i. 9 - Sports/Entertainment
 - j. 10 - Fashion & Apparel
 - k. 11 - Home Goods
 - l. 12 - Other Retail Goods
 - m. 13 - Little or no Pull
 - n. 0 - Vacant

Appendix A shows all 135 retail concepts within the CI. Before the CI is used to make sense of business location data, it is used as a guide for field crew surveying efforts. Tenants exist aside from those shown in the CI. Their importance, however, in the context of

the grocer anchored center is minimal and hence their locations and names were not included.

Trade Area Delineation

Prairieview Center is located on the southern boundary of Hennepin County, adjacent to Carver and Scott Counties in Eden Prairie, MN, a southwestern suburb of Minneapolis, MN. It is furthermore located in the northeast quadrant of Highway 5 and Prairie Center Drive (Figure 1).

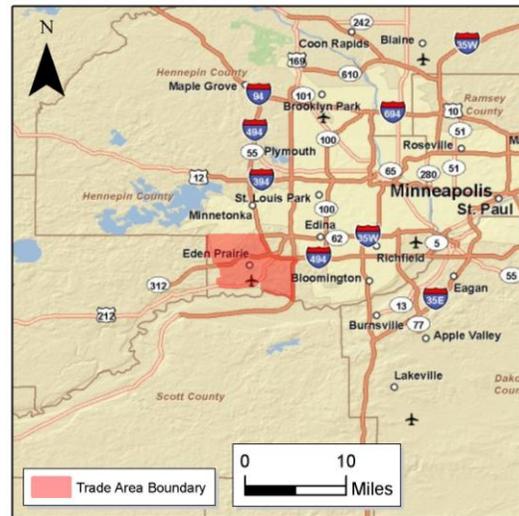


Figure 1. General trade area location Map.

While each business has its own trade area, the trade area for a shopping center generally corresponds to the trade area of its largest retailer. For a regional mall, this is typically the department stores. For a community center, this might be a Target or a Wal-Mart. For the purpose of this analysis, it is a grocer, Rainbow Foods.

The trade area for Prairie View Center was delineated using customer data from the Rainbow Foods store, the anchor tenant of this shopping center. Initially, multiple methods were

considered including simple circular boundaries, and drive-time polygons around the center. These assume that the store has a spatial monopoly on people living around it which is not realistic given the population density of the area (Dudley, 1996).

Next, the Huff Model and Theissen (Voronai) polygon method were used to delineate trade areas in MapInfo's Professional 9.0 and Vertical Mapper. The Huff Model predicts the probability of a consumer to decide to shop at one store given its attractiveness and the presence of competing stores. This model can be difficult to use in comparing single stores because factors like attractiveness have to be quantified. When used in the context of a center this model was found to be ineffective as too

many variables between the types of centers were present.

The Voronai polygon delineates trade areas based on a consumer choosing the closest store to shop at. This method neglects how consumers are attracted to certain retail types and are willing to pass other stores to shop at their preferred location. When trade areas from both methods were considered they were found to exclude areas with high densities of Rainbow Food's sales. This was expected considering the high density of Rainbow Food's sales which occur in close proximity to some of its competitors (Figure 2).

Many methods were tested against the Rainbow Food's customer

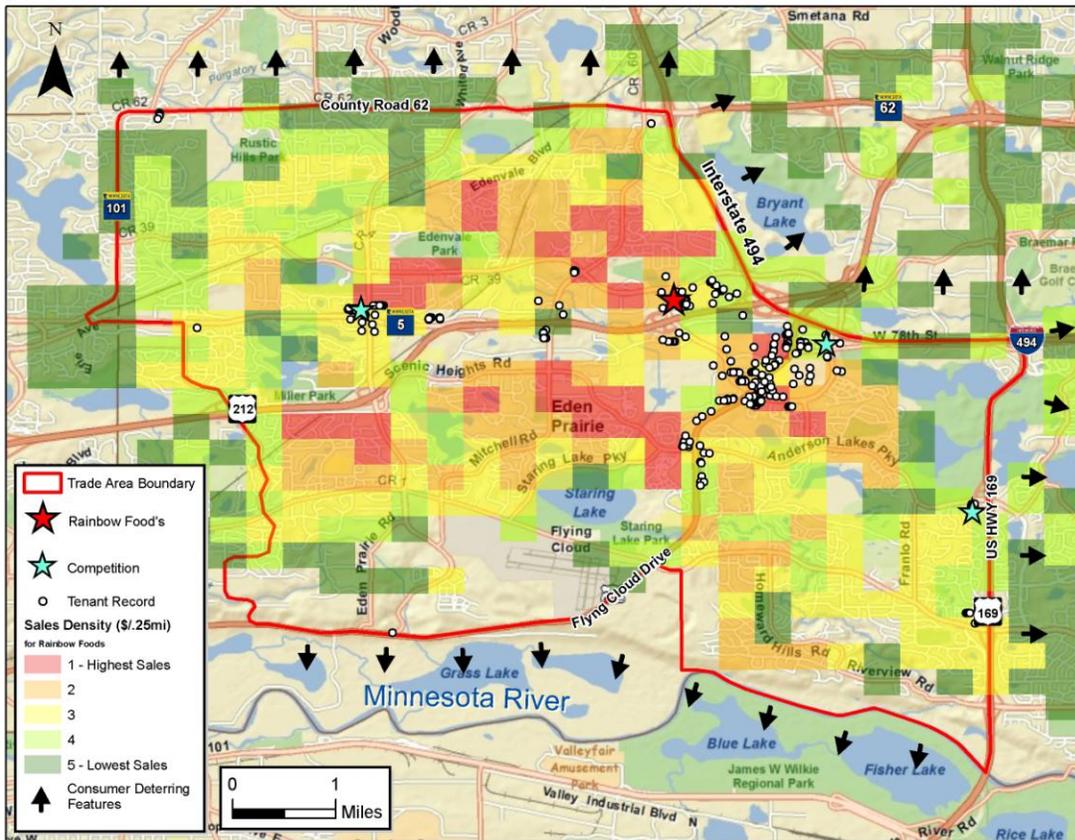


Figure 2. Sales density data (represented in total amount spent per quarter mile) for Rainbow foods at Prairieview Center (legend redacted at request of UPI, red areas indicate areas of highest expenditures).

data in an attempt to find a high correlation to one trade area method. This was done because stores are often reluctant to share customer data. Finding an easy replicable method that correlated with customer data which could be reproduced was preferred. However this was not feasible. While the benefits of certain models, such as the Huff model, have been extremely effective for certain retail types (e.g. convenience goods) (Rogers, 2004), no model was used in the delineation of this trade area. Alternatively the decision was made that the trade area would be the area where 80% of the anchor tenant store's customer sales were located. This conclusion was based on the opinion of an analyst with 30+ years of experience in grocer center analytics that uses this method for his studies.

The trade area covers 25.3 square miles and includes an estimated population of 55,056 (ESRI, 2009). It is bordered to the north by County Road 65, to the east by Interstate 494, to the south by the Minnesota River and to the west by Dell Road and County Highway 101. Prairieview Center is located along the northeastern boundary of trade area. The location of Prairieview Center within the trade area dictates that physical boundaries play a role in a consumer's choice of choosing a location to shop. Consumers are reluctant to cross physical boundaries such as freeways or rivers. As can be seen in Figure 2, Rainbow Foods drew far more customers from the south and west than it did from the north and east.

Software Requirements

ArcMap 9.3 ArcServer, ArcSDE, Microsoft Access, and Microsoft Excel, were used to acquire, analyze and

visualize the data.

Data Acquisition and Manipulation

Base Dataset

On September 19, 2009 UPI surveyed the Prairieview Center trade area for all tenants of interest based on the CI. Before starting the survey, UPI reviewed the CI to ensure familiarity with its content. A copy of the CI was brought along during the field survey for consultation, if needed.

A laptop with a version of ArcMap 9.3 was used to record field data. Prior to conducting the survey a workspace containing zoning data, roads and an aerial of Hennepin County, was constructed. The zoning data came from the City of Eden Prairie and aided in isolating the areas that needed to be canvassed. Roads lying in areas where retail was an acceptable use were selected and mapped along with being exported to an Excel spreadsheet which was used as a checklist when driving the market.

Surveying retail tenant spaces was an arduous task. Thankfully the majority of retail space (84%) in this trade area was not free standing so multiple records were able to be recorded from one location. At each recorded location, a center point was placed on the rooftop of the tenant space in ArcMap. When locations of tenant spaces on reference aerials were in question, a Global Positioning System (GPS) point was taken in front of the store and the GPS ID recorded so the data could be matched to that point during data preparation. For each tenant space a name, NAICS code, data on whether the space is freestanding or part of a center, and previous tenant data (if

visible from signage etc.) was recorded. Shop area was also recorded after the field survey was completed by referencing site plans for the centers where the spaces reside. Where these records were not available, the area was estimated by drawing a polygon on the space and calculating the area in ArcMap. This trade area was surveyed once in March, 2009. Hence, the majority of the work was in re-verifying the 2009 survey.

Comparison Datasets

Three datasets from business location providers used during previous iterations of Re-lytics were compared to determine accuracy. All datasets were obtained within a two week time frame from the survey of the Base Dataset. Time was an important factor in this analysis as the comparison datasets constantly change through updates. Having an accurate snapshot of what each dataset contained at the time of the field survey was of the utmost importance. The names of the providers and their product were not used in this analysis at the request of the providers. Instead, Dataset A – C was used in referring to the data. All datasets were obtained through existing license agreements with UPI. Some of the datasets were focused strictly on retail tenants while others included all types of businesses.

Two of the datasets were served through spatial applications. These allow users to define the area of interest and the data present in that area is returned in the form of a spreadsheet. Tenant and supplemental information including latitude and longitude were also included in the data. Previous experience dictated that the accuracy of many of these datasets would not be as good as the field data. To adjust for possible spatial

inaccuracies, the area of interest used to query data was the trade area with a ½ mile buffer added. The area of interest shapefile was uploaded into the applications and defined the area that data would be queried from. One of the applications from which a dataset was retrieved had no mechanism for uploading shapefiles to query area. In this application a free hand trade area buffer, which greatly surpassed the previous ½ mile buffer, was used to extract the data.

Methodology

Data Matching

Each comparison dataset was subject to a “scrubbing” process in which all erroneous data were deleted. This task involved first querying out the desired NAICS codes as determined by the CI. This process was used as a sorting mechanism so that fewer records would have to be manually verified later in the process. NAICS codes that were altered for purposes of the CI, either by being sub-grouped or generalized, were returned to their original code format for the matching process.

In ArcMap a query statement containing all of the desired NAICS codes was constructed and run against two of the datasets. The statement was constructed so that only the first 3 digits of the overall 5 or 6 of the code were queried followed by a wildcard qualifier. This allowed for errors in the NAICS codes of the third party data to be selected even if the last 2 or 3 digits of the code were incorrect. The results of this analysis can be seen in Table 2.

This methodology was not applied to Dataset C because it used

Standard Industrial Classification (SIC) codes which were officially replaced by

Table 2. Results of NAICS query on Datasets A and B.

	Original Records	Post NAICS Query	Percent Decrease
Dataset A	765	437	42.9%
Dataset B	2949	784	73.4%

the NAICS in 1997. Additionally, this dataset contained no latitude or longitude values so it required geocoding of addresses before data existing within the trade area buffer could be extracted. In total, 780 records were extracted for Dataset C. The USA geocoding service running on the standard ESRI geocoding address locator based on Tele Atlas and ESRI Street Data in ArcMap 9.3 was used to geocode the addresses. The results of the first run yielded 733 matched records and 47 tied. Of this first iteration, 779 records of the overall 780 had matching value scores between 80 and 100. Of these records, the following results were obtained:

- 1) 369 were geocoded to address points
- 2) 383 were geocoded to the street address level and,
- 3) 27 were geocoded to the zip code level.

The 27 records matched to zip code level geometries were geocoded using Northmarq's proprietary retail database. Once all data were geocoded data within the ½ mile trade area buffer were extracted resulting in 328 records. Next the comparison datasets were analyzed against the field verified data to determine the amount of matching

records. This process involved creating an ID field in each of the comparison datasets. Once a matching record was found the ID from the base dataset was transferred to the matching tenant record in the comparison dataset. This ID field served as a primary key in a future analysis. Unlike the NAICS query no automated functions for matching names could be devised. Though official names for tenants exist an official methodology of entering this data by researchers does not. A good example is how Leann Chins' name was entered differently in each comparison dataset.

ASIA GRILLE BY LEEANN CHIN
 CHIN LEEANN INC
 LEEANN CHIN CHINESE CUISINE

Due to the varying names which signify the same tenant in different databases the process of manually matching tenants was extremely time consuming. Only one comparison dataset was analyzed against the base dataset at a time. Each dataset was sorted alphabetically and analyzed line by line to isolate matches. Datasets were analyzed twice to assure that no matching records had been missed.

Spatial Accuracy

Once all of the databases had been analyzed, the next step was determining the spatial accuracy of the matching records between the databases. An extension in ArcView 3.x was found that would do this task. Unfortunately, ArcView 3.x and Windows Vista are not compatible. The author of the extension was contacted and the code behind the analysis was discussed and replicated in Microsoft Access. Per compatibility conversion instructions, the data were

reprojected into NAD_1983_StatePlane_Minnesota_South_FIPS_2203_Feet using ArcCatalog and the latitude and longitude values were recalculated in feet. This would provide for final comparison distances to be calculated in feet. Next the DBASE IV files from each of the comparison datasets were joined to the Base Dataset on the ID field. All records from the join, and not only the matching records, were kept. This was done so that all comparison datasets could be joined to the Base Dataset. The dataset was then imported into Microsoft Access 2007 and the following statement was run to determine straight line distances between matching records (example from comparison dataset A shown).

```
SELECT Base.ID, Base.X, Base.Y,
Comp_A.ID, Comp_A.X, Comp_A.Y,
Sqr((([Base].[x]-
[Comp_A].[x])*([Base].[x]-
[Comp_A].[x])+([Base].[y]-
[Comp_A].[y])*([Base].[y]-
[Comp_A].[y])) AS dist
FROM Base LEFT JOIN Comp_A ON
Base.ID = Comp_A.ID
```

This statement is the Pythagorean Theorem. To confirm the validity of the Access analysis, the following field calculation was run in ArcMap (example from comparison dataset A shown).

```
sqr ( ( ([x_1] - [x]) * ([x_1] - [x]) ) + (
([y_1] - [y]) * ([y_1] - [y]) ) )
```

Categorical Indexing

The final phase of the analysis was to join the CI to each of the datasets for comparison. From this conclusions were drawn as to what opportunities existed in the market from the Base Dataset. Additionally when the CI was coupled

with the comparison datasets the discrepancies between the datasets were isolated to display the effect that using inaccurate data can have on analysis of this caliber.

Data from the Base Dataset and the comparison datasets were joined to the CI using the NAICS code as the primary key. This resulted in a database of existing tenants matched to their values and qualifiers relative to their importance to a grocer anchored center. Conversely the CI was then joined to the dataset to select out the values that matched. The switch selection function in the table view was then used to select the values which did not occur in the dataset. This exercise resulted in isolating retail concepts not found in the trade area. These tenant types would be of interest to pursue to fill vacancies.

The Group columns in all datasets were then queried for the Group “1” tenants which are considered “Traffic Generators.” This column is typically the first value considered when the CI is incorporated into data. No “Traffic Generators” were found in the data. Next the Priority column in the Base Dataset was queried for Priority “A” tenants. The Priority column is taken into consideration after the “Traffic Generators” are examined.

Finally a summary was completed on the Tenant Type column. This was facilitated by summarizing the Tenant Type field in the attribute table which produced a count of shops per Tenant Type and summarized the shop space for each. A field was then added and the field calculator was used to divide the area per Tenant Type by the population of the trade area. The result was or the amount of floor space per Tenant Type (Ft²/Capita) for every

person in the trade area (55,056) as seen in Appendix C.

Results/Discussion

The datasets analyzed in this study were produced using varying methodologies and each served another purpose aside from providing business locations. The methodologies vary. Some models rely on the real estate professional to enter data back into the service that they subscribe to. This creates accurate spatial data, however the rate at which the data is populated and updated is low because no one wants to spend their time updating data. Other services focused on creating lists for direct marketing, telemarketing, marketing planning, lead generation, sales planning, customer analysis, and credit reference. These databases are good to the effect that they include a tremendous amount of information, however their spatial accuracy is only as good as the geocoding process used. A good example of this can be seen in the geocoding that was needed for Dataset C. In that exercise, 47% of the points landed on the actual address, 49% landed somewhere on the proper street, and 4% were left unmatched and needed manual guidance.

When compared to the Minneapolis Metropolitan Statistical Area, which covers some approximate 6,400 mi², assuming a constant density of retail of 780 points/25mi², (which was the initial record count of Dataset C) 8,000 records would need to be manually placed. Unless the providing company has a staff dedicated to this function, the data should be treated with extreme suspicion.

In total, 391 records were recorded during the field survey of the

trade area. This included sub-tenants such as Banfield Veterinarian Clinics which sub lease space from Petsmart's at many of their locations. The sub-tenant category also included concepts that larger retailers specialize in though they are located under one roof; examples include Home Depot Equipment Rental and Cub Pharmacy. Technically these are not freestanding tenants though as far as the competitive landscape is concerned they have draw just as any other retail tenant would so they were included in the analysis. Not included in the analysis was Eden Prairie Plaza as it is a different type of center all together than the grocery anchored tenant concept and has totally different dynamics of draw. This means people going to Eden Prairie Plaza are likely not going for the sole purpose of buying groceries and diapers as a customer of the Prairieview center might.

Data Matching

Of the datasets tested, Dataset A had the best accuracy in terms of the quantity of records matched (Table 3). This was expected as this provider was proven by an independent audit to have the highest quality data in the industry. The results however are unacceptable and will not provide much insight in the context of real estate analysis.

Table 3. Results of data matching analysis.

	Matches	Misses	Accuracy Rate
Dataset A	213	178	54.50%
Dataset B	139	252	35.50%
Dataset C	122	269	31.20%

Spatial Accuracy

Of the datasets tested, Dataset A had the highest spatial accuracy of data (Table 4). The maximum distances shown in this analysis were extreme for the datasets overall as can be seen by the mean.

Table 4. Results of spatial accuracy analysis.

	Count	Minimum Distance (ft)	Maximum Distance (ft)	Mean (ft)
Dataset A	213	8.6	10,249.7	367
Dataset B	139	97.9	24,047.0	1,258
Dataset C	122	12.2	26,188.7	1,115

Typically, 5 to 10 records per dataset were dramatically off spatially. The reason for this was that tenants were matched with like tenants of the same name from another location. This occurred because the data that the tenant should have matched with was missing. Though this error was caught in the analysis process, the data were not removed. This was an analysis of the data as delivered and though it was meant to represent another location it still was recorded within the trade area. The remaining records were generally close to the base record. However, depending on the comparison dataset used, the data is not accurate enough to base site specific decisions on. The situation as seen in Figure 3 is very common where the comparison datasets may place the same tenant in another center altogether.

Categorical Indexing

Conclusions from Base Dataset

Once the CI was coupled with the Base Dataset, opportunities existing in the marketplace could be isolated. The results of this analysis can be seen in Appendix B. Overall, 28 of 135 (21%) retail concepts found in the CI were not

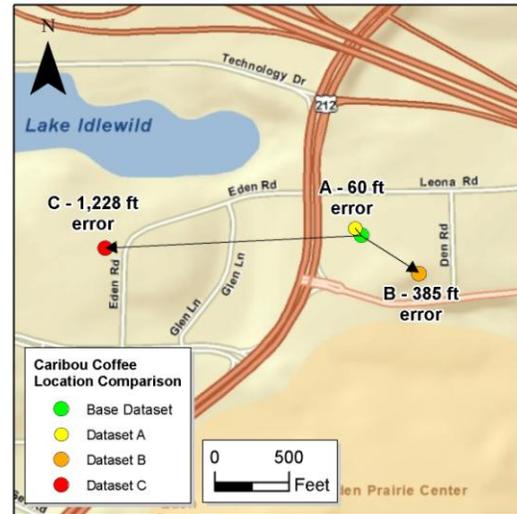


Figure 3. Example deviation between base and comparison datasets.

found in the Prairieview trade area. The results were first sorted by the Group column which resulted in no "1" values or "Traffic Generators" being missing from the trade area. "Traffic Generators" encompass the retail concepts that are visited most when making trips to the supermarket and often generate trips to the center with no intention of stopping at the anchor grocer. Examples of "Traffic Generators" are retailers that people utilize most often including banks, drug stores, liquor stores, and gas stations. Given that one of these is not already in a given center or adjacent to it, they can typically sustain business.

The fact that no "Traffic Generators" were absent in the trade area supported the CI's group ranking of these types of business as being the most important peripheral business types. Though the CI can be used in many

ways, especially when coupled with the aforementioned supplemental data, the next step used in this analysis was to query the Priority column. Three A Priority Tenant Types were identified as not being present in the trade area. These Tenant Types included: “Check Cashing,” “QSR BBQ,” and “Shoe Repair.” Any business resembling one of these Tenant Types would be a good concept to pursue for vacancies at Prairieview Center.

Aside from Tenant Types not present in the market, Tenant Types with little presence (Ft²/capita), were also of interest. The least and most represented Tenant Types within the trade area can be seen in Appendix C. Among the least represented are three A Priority Tenant Types including “Packing / Private Mail Store,” “Juice / Smoothie Snacks Bars,” and “QSR Bagels.” These Tenant Types would be good concepts to target for bringing new tenants to the market or for relocating the existing tenants in the trade area to a site that would better serve their concept. Appendix C also shows the least represented Tenant Types of the “A” Priority and “Traffic Generators” Group columns.

Once again, the validity of the CI was supported by these results. The least represented “A” Priority Tenant Type was “Juice / Smoothie Snack Bars” which had an overall presence of 0.021 ft² per person in the trade area. The least represented of the “Traffic Generators” Group was “Liquor” which had an overall presence of 0.392 ft² per person in the trade area.

Conclusions from Comparison Datasets

The analysis of the comparison datasets concluded a completely different set of results (Table 5).

The Base Dataset showed a total of 42 “Traffic Generators” within the trade area which resulted in 1,164,177 ft of shop space. From examining the Base Dataset it would appear that the market might have some room open for new tenants. According to Dataset A, only 25

Table 5. Individual categories missed by datasets based upon the Index.

	Missed Categories Count	Percent Missing Overall	Actual Categories missed (26 not in market)
Dataset A	61	45.5%	35
Dataset B	71	53.0%	45
Dataset C	77	57.5%	51

“Traffic Generators” exist in the trade area as a whole resulting in 317,800 ft of space that is not being used by an additional 17 major tenants. Based on these results, Prairieview could support additional space and should make way for Kohl’s or a Cub Foods as none existed in the trade area according to Dataset A.

Dataset B showed a trade area that was more desolate of basic goods than Dataset A. It reports that only 18 “Traffic Generators” existed in the trade area and failed to consider an additional 24 “Traffic Generators” such as Sears, multiple banks, and liquor stores which comprise 319,209 ft of space.

Dataset C concluded only 15 “Traffic Generators” were present, which ignores 27 other “Traffic Generators” for a grand total of 758,724 ft of shop space that is missing from Dataset C’s competitive environment (Table 6). If this data were valid, the trade area would benefit by the addition

of a Wal-Mart or Costco because it would appear that plenty of gaps existed which need to be filled. As a note, all retailers mentioned in this section do exist within this trade area based on the field verified Base Dataset.

Table 6. Group 1 “Traffic Generators,” missed by third party datasets.

	Traffic Generators Missed (out of 42)	Ft² of Traffic Generators Missed	% Ft² Missed
Dataset A	17	317,800	27.3
Dataset B	24	319,209	27.4
Dataset C	27	758,724	65.2

Conclusions

Realistically speaking, no real estate professional, especially in today’s market, would get far into the due diligence process before getting a better understanding of the market than the third party datasets examined had to offer. The point of this research was twofold: first, great insight can be gained from combining informal knowledge to precision data; second, any analysis is only as good as the data that it is based on.

Many systems were examined as possible solutions for UPI before Re-lytics was developed. Of all of the models and applications considered, the validity of the base data nearly always came up as an issue. Based on this premise, the decision was made to build an entirely new system not based upon existing models.

For this study, only the parts of the base data of the Re-lytics application were assessed as UPI requested their entire process not be discussed. In a real

screening of a trade area, many more factors and data sources would have been examined as noted previously in the Re-lytics section.

Acknowledgements

I would like to thank John Breitingger, Vice President of Development at UPI for giving me the opportunity to work on this project. I would also like to thank Dirk Koentopf, GIS Director of GIS and Market Analytics Northmarq for the opportunity to be a part of their GIS team. Finally, I would like to thank John Ebert for his support through my masters program.

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Appendix A. Categorical Index (CI). 135 categories of retail tenants found by UPI to have a high correlation with grocer anchored retail centers.

ID	Tenant Type	NAICS_Full	NAICS_Join	Priority	Demand	Group
1	Vacant	x	X			0
2	Grocery	445110	445110	A	Conv	1
3	Liquor	445310	445310	A	Conv	1
4	Drug	446110	446110	A	Conv	1
5	Gas Service Station	447190	447190	A	Conv	1
6	Discount Department Store	452112	452112	A	Int.	1
7	Wholesale Clubs & Supercenters	452910	452910	A	Int.	1
8	Post Office / Postal Service	491110	491110	A	Conv	1
9	Bank, Savings & Loan, Credit Union	522110, 522120, 522130	522110	A	Conv	1
10	Department Store	452111	452111	A	shop	1
11	Packaging / Private Mail Store	492110	492110	A	Conv	2
12	Check Cashing	522390	522390	A	Conv	2
13	Video	532230	532230	A	Conv	2
14	Day Care	624410	624410	A	Conv	2
15	Shoe Repair	811430	811430	A	Conv	2
16	Tailor	811490	811490	A	Conv	2
17	Dry Cleaning / Laundry	812320	812320	A	Conv	2
18	Specialty Food (Meat Market, Fish & Seafood, Produce Market, Bakery)	(445210, 445220, 445230, 445291)	445210	B	Int.	2
19	Convenience Stores	447110	447110	B	Conv	2
20	News / Magazines	451212	451212	B	Int.	2
21	Tobacco	453991	453991	B	conv	2
22	on-line auction resellers	454112	454112	B	Int.	2
23	Auto Repair & Maintenance	811111	811111	B	Int.	2
24	Car Wash	811192	811192	B	conv	2
25	Printing/Sign Shop	323113, 323114	323113	C	Int.	2
26	Locksmiths	561622	561622	C	Int.	2
27	Health / Nutrition	446191	446191	A	Int.	2
28	Gifts / Cards	453220	453220	A	Conv	2
29	Floral	543110	543110	A	Conv	2
30	Hair Care - barber / quick serv	812111	812111	A	Conv	3
31	Hair Care - full service salon	812112	812112	A	Conv	3
32	Nails	812113	812113	A	Conv	3
33	Day Spa, Massage	812199Spa	812199Spa	A	Int.	3
34	Tanning	812199Tan	812199Tan	A	Conv	3
35	Health club -- full service	713940HC	713940HC	B	Conv	3
36	Meal Preparation	311991	311991	B	Int.	3
37	Beauty School	611511	611511	B	Int.	3

ID	Tenant Type	NAICS_Full	NAICS_Join	Priority	Demand	Group
38	Fitness studio / yoga / Pilates studio	713940, 611699	713940	B	Int.	3
39	Diet Center	812191	812191	B	Int.	3
40	Music School	611610Mu	611610Mu	B	Int.	3
41	Dance Studio	611610DS	611610DS	C	Int.	3
42	Martial Arts	611620	611620	C	Int.	3
43	Driving School	611692	611692	C	Int.	3
44	Business Service Centers & Copies	561439	561439	B	conv	3
45	Travel Agencies	561510	561510	B	Int.	3
46	Restaurant Full Service	722110	722110	A	Int.	4
47	Restaurants Limited Service	722211	722211	A	Conv	4
48	QSR Asian	722211As	722211As	A	Conv	4
49	QSR Bagels	722211Ba	722211Ba	A	Conv	4
50	QSR BBQ	722211BB	722211BB	A	Conv	4
51	QSR Burgers	722211Bu	722211Bu	A	Conv	4
52	QSR Chicken	722211Ch	722211Ch	A	Conv	4
53	QSR Coffee	722211Co	722211Co	A	Conv	4
54	QSR Deli	722211De	722211De	A	Conv	4
55	QSR Ethnic - other	722211Et	722211Et	A	Conv	4
56	QSR ice cream	722211lc	722211lc	A	Conv	4
57	QSR Mexican	722211Me	722211Me	A	Conv	4
58	QSR Pizza	722211Pi	722211Pi	A	Conv	4
59	QSR Sandwich / Subs	722211Sa	722211Sa	A	Conv	4
60	Juice/Smoothie Snack Bars	722213	722213	A	Conv	4
61	Bars	722410	722410	B	Int.	4
62	Mortgage Loan Brokers	522310	522310	B	Prof.	5
63	Securities Brokerage	523120	523120	B	Prof.	5
64	Investment / Wealth Management	523930	523930	B	Prof.	5
65	Title Insurance	524127	524127	B	Prof.	5
66	Insurance Agencies & Brokerage	524210	524210	B	Prof.	5
67	Real Estate Brokerage	531210	531210	B	Prof.	5
68	Attorneys	541110	541110	B	prof	5
69	Accounting, Tax Prep, Bookkeeping	541211	541211	B	Prof.	5
70	Employment Agencies, Temporary Help Services	561311, 561320	561311	B	prof	5
71	Optician / Optical Store	446130	446130	B	Int.	6
72	Home Health Equip Rental	532291	532291	B	Int.	6
73	Medical	621111	621111	B	prof	6
74	Dental	621210	621210	B	prof	6
75	Chiropractor	621310	621310	B	prof	6
76	Optometrists	621320	621320	B	prof	6
77	Physical / Occupational Therapy	621340	621340	B	prof	6

ID	Tenant Type	NAICS_Full	NAICS_Join	Priority	Demand	Group
78	Mental Health / Counseling	621420	621420	B	prof	6
79	Clinic	621498	621498	B	prof	6
80	Veterinarian	541940	541940	B	prof	7
81	Libraries	519120	519120	B	conv	8
82	Government Service Centers	921190	921190	B	Conv	8
83	Bowling Alley	713950	713950	B	Int.	9
84	Theaters	512131	512131	B	Int.	9
85	Apparel Men's	448110	448110	C	shop.	10
86	Apparel - Women's	448120	448120	C	shop.	10
87	Apparel - Children's	448130	448130	C	shop.	10
88	Shoes	448210	448210	C	shop.	10
89	Jewelry	448310	448310	C	shop.	10
90	Consignment stores	453310	453310	C	shop.	10
91	Apparel - Specialty (tux/dress r	532220	532220	C	shop.	10
92	Home Improvement/ Remodelers	236118	236118	B	prof	11
93	Interior Design Services	451410	451410	B	prof	11
94	Finance Co	522291	522291	B	Int.	11
95	Architecture Services	541310	541310	B	prof	11
96	Hardware	444130	444130	A	Int.	11
97	House wares	423620HW	423620HW	B	Int.	11
98	Paint / Wall coverings	444120	444120	B	Int.	11
99	Garden Center	444220	444220	B	Int.	11
100	Building Materials & Supplies	444110	444110	C	Int.	11
101	Mattress	442110Ma	442110Ma	C	shop.	11
102	Furniture	442110Fu	442110Fu	C	shop.	11
103	Flooring	442210Fl	442210Fl	C	shop.	11
104	Window Treatments	442291	442291	C	Int.	11
105	Home Furnishings	442299	442299	C	shop.	11
106	Kitchen Stores	442299KS	442299KS	C	Int.	11
107	Appliances	443111	443111	C	shop.	11
108	Computer / Software Stores	443120	443120	C	shop.	11
109	Outdoor Power Equipment	444210	444210	C	shop.	11
110	Gallery	453920	453920	C	shop.	11
111	Pool/Spa Store	423910	423910	C	Int.	11
112	Cosmetics & Beauty Supply	446120	446120	B	Int.	12
113	Electronics	423620	423620	B	shop	12
114	Ink Cartridges	423840	423840	B	Int.	12
115	Auto Parts -- TBA	441310	441310	B	Int.	12
116	Frame Shop	442299FS	442299FS	B	Int.	12
117	Cellular	443112	443112	B	conv	12

ID	Tenant Type	NAICS_Full	NAICS_Join	Priority	Demand	Group
118	Camera / Photo Supplies, Photo Finishing	443130, 812921	443130	B	Int.	12
119	Sporting Goods	451110	451110	B	Int.	12
120	Fabric Store	451130	451130	B	Int.	12
121	Musical Instruments & Supplies	451140	451140	B	Int.	12
122	Variety / Dollar Store	453990	453990	B	Int.	12
123	Tool Rental	532210	532210	B	Int.	12
124	Photography Studio, Portrait	541921	541921	B	Int.	12
125	Hobby / Toys / Games	451120	451120	C	Int.	12
126	Tires	423130	423130	B	Int.	12
127	Batteries	423610	423610	B	Int.	12
128	Art / Craft Supplies	451120Art	451120Art	B	Int.	12
129	Books	451211	451211	B	Int.	12
130	Music	451220	451220	B	Int.	12
131	Office Supplies	453210	453210	B	Int.	12
132	Pets / Pet Supplies / Pet Care / Grooming	453910, 812910	453910	B	Int.	12
133	Little or No Pull Category	13	13	D		13
134	Apparel - Family / Unisex	448140	448140	C	shop.	10
135	Fruit and Vegetable Stands, Permant Academies / Schools / Colleges /	445230	445230	C	conv	12
136	Universities / Tutors	611310	611310	B	prof	5

Appendix B. Tenant Types not found in the trade area determined by joining the data from Appendix A to the Base Dataset. The following were data that had no matches in the join. Highlighted are the A Priority Tenant Types that would be the first to address in a target marketing campaign.

ID	Tenant Type	NAICS	Priority	Demand	Demand	Group
125	Check Cashing	522390	A	Financial	Conv	2
134	QSR BBQ	722211BB	A	Food Service	Conv	4
135	Shoe Repair	811430	A	Service	Conv	2
109	House wares	423620HW	B	Home	Int.	11
110	Ink Cartridges	423840	B	service	Int.	12
112	Cosmetics & Beauty Supply	446120	B	Retail	Int.	12
113	Optician / Optical Store	446130	B	Professional	Int.	6
116	Musical Instruments & Supplies	451140	B	Retail	Int.	12
117	Books	451211	B	Retail	Int.	12
118	News / Magazines	451212	B	Retail	Int.	2
119	Interior Design Services	451410	B	home	prof	11
121	Tobacco	453991	B	Retail	conv	2
122	Theaters	512131	B	Entertainment	Int.	9
123	Libraries	519120	B	civic	conv	8
124	Finance Co	522291	B	Financial	Int.	11
126	Home Health Equip Rental	532291	B	health	Int.	6
127	Architecture Services	541310	B	Home	prof	11
128	Photography Studio, Portrait	541921	B	service	Int.	12
129	Employment Agencies, Temporary Help Services	561311	B	Professional	prof	5
131	Academies / Schools / Colleges / Universities / Tutors	611310	B	service	prof	5
132	Physical / Occupational Therapy	621340	B	health	prof	6
133	Mental Health / Counseling	621420	B	health	prof	6
136	Government Service Centers	921190	B	civic	Conv	8
111	Fruit and Vegetable Stands, Permant	445230	C	Retail	conv	12
114	Apparel Men's	448110	C	Retail	shop.	10
115	Hobby / Toys / Games	451120	C	Retail	Int.	12
120	Gallery	453920	C	Retail	shop.	11
130	Locksmiths	561622	C	Service	Int.	2

Appendix C. Produced by joining Appendix A to the Base Dataset, summarizing the data on the Tenant Type, and dividing the sum FT² of each Tenant Type by the estimated population of the trade area. The results show the level of representation each Tenant Type has in the trade area.

Least/ 5 Most Represented Tenant Types in Market by FT²/Capita

Tenant Type	Count Of Tenants in TA	NAICS_Join	Sum_SF	Priority	Demand	Group	SF per Cap.
Title Insurance	1	524127	799	B	Prof.	5	0.015
Packaging / Private Mail Store	1	492110	1,000	A	Conv	2	0.018
Juice/Smoothie Snack Bars	1	722213	1,174	A	Conv	4	0.021
QSR Bagels	1	722211Ba	1,176	A	Conv	4	0.021
Accounting, Tax Prep, Bookkeeping	1	541211	1,217	B	Prof.	5	0.022
Grocery	4	445110	209,424	A	Conv	1	3.804
Home Improvement/ Remodelers	2	236118	216,671	B	prof	11	3.936
Discount Department Store	2	452112	264,824	A	Int.	1	4.810
Health club -- full service	2	713940HC	353,629	B	Conv	3	6.423
Department Store	4	452111	359,784	A	shop	1	6.535

Priority A's by FT²/Capita

Tenant Type	Count Of Tenants in TA	NAICS_Join	Sum_SF	Priority	Demand	Group	SF per Cap.
Juice/Smoothie Snack Bars	1	722213	1,174	A	Conv	4	0.021
QSR Bagels	1	722211Ba	1,176	A	Conv	4	0.021
Gifts / Cards	2	453220	1,992	A	Conv	2	0.036
QSR Chicken	1	722211Ch	2,531	A	Conv	4	0.046
Health / Nutrition	2	446191	2,694	A	Int.	2	0.049
QSR ice cream	2	722211c	2,735	A	Conv	4	0.050
Tailor	3	811490	3,567	A	Conv	2	0.065

Group 1 - Traffic Generators by FT²/Capita

Tenant Type	Count Of Tenants in TA	NAICS_Join	Sum_SF	Priority	Demand	Group	SF per Cap.
Liquor	3	445310	21,555	A	Conv	1	0.392
Post Office / Postal Service	4	491110	27,880	A	Conv	1	0.506
Gas Service Station	10	447190	33,105	A	Conv	1	0.601
Drug	3	446110	46,083	A	Conv	1	0.837
Bank, Savings & Loan, Credit Union	11	522110	51,790	A	Conv	1	0.941
Wholesale Clubs & Supercenters	1	452910	149,731	A	Int.	1	2.720
Grocery	4	445110	209,424	A	Conv	1	3.804
Discount Department Store	2	452112	264,824	A	Int.	1	4.810
Department Store	4	452111	359,784	A	shop	1	6.535