ГЕОИНФОРМАЦИОННОЕ ОБЕСПЕЧЕНИЕ ПРИНЯТИЯ РЕШЕНИЙ

УДК 54.02

M. Herron[1], D. Jones[2], J. Godfredson[3], C. Donley[4]

PAINT SUPPLIES AND LOCATION: EXAMINING ICI

Abstract. *How important is location to an international retailer? Not just any retailer but the second largest paint retailer in the world.*

Imperial Chemical Industries (ICI) was a British chemical company and was at one stage the largest manufacturer in Britain. Formed from the merger of several leading British chemical companies in 1926, ICI makes paints and speciality products, including food ingredients, speciality polymers, electronic materials, fragrances and flavourings. ICI paints purchased the Cleveland Ohio-based Glidden Coatings & Resins (Glidden Paint Company) in 1986 for USD$580 million. The addition of Glidden to ICI's North American operations more than doubled that subsidiary's annual sales to $3 billion and increased ICI's corporate presence in the United States dramatically.

A decline in paint and solvent consumption during the 2000 decade slowed the average growth of the paint industry to about 2% annually. Rauch Associates, the leading US paint analyst firm, predicted near-term growth to slow even further to 1.2% per annum.

Through the 1990's and early 2000's Glidden paint was sold only through Glidden-badged paint stores and smaller retailers under licence, developing a strong identifiable brand and reputation.

How were potential Glidden retail paint store locations chosen across America to enable and support this market growth? This paper investigates the real process that was developed and applied to construct a national network of retail outlets across the United States. It also highlights the change in direction that occurred at ICI paints culminating in its eventual acquisition by AkzoNobel in 2008 who immediately sold parts of ICI to Henkel, and integrated ICI's remaining operations within its existing organisation. This sale and the associated corporate restructure caused considerable change in marketing directions allowing for the first time the selling of Glidden paint products to mass market centres such as Home Depot.

This change in marketing strategy caused the traditional Glidden retail store network to decline to about 420 stores nation-wide, with the subsequent effect that ICI (Glidden) gave up some of its profit margin to third-partner retailers in exchange for higher sales volume.

Key words: *optimal store location, geographic data, GIS, demographic analysis.*

Overview. How do you rescue a global brand with billions that is struggling in the largest consumer market in the world? The industry in question is the United States commercial and consumer paint market worth $10 billion annually and the company in question is ICI paints.

ICI paints could not answer four fundamental questions regarding the American Paint market with any level of confidence. The questions included:

1. How large is the US paint market?
2. What is the ICI market share in residential, commercial and industrial market?
3. Are the ICI current stores in the right locations?

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4. Does ICI have adequate store coverage to service the entire American paint market?

ICI paints from the United Kingdom bought the legendary Glidden paint company in Cleveland Ohio in 1986. Glidden was the second largest paint manufacturer in North America at the time of purchase.

ICI wanted to optimize its American retail store network which encompassed over 500 retail outlets in all 50 US states.

A consulting firm that specialized in retail distribution was contracted by ICI to undertake the massive job. The firm that was chosen to do the job was the Australian based IF Consulting. The project which was given the code name of SLS (i.e. standing for Store Location System) commenced in May 1999 and was completed in May 2000. The challenge was simple. Stop a $400 million a year loss in retail sales resulting from a poor retail network and make it profitable or close the retail network resulting in thousands of lost jobs throughout the United States. The challenge was daunting. The story of the turnaround begins.

Introduction. To undertake a job like this you need specialists and a team to do the work. For this job the five specialists came from Australia, Japan, Hong Kong, New Zealand, Canada and the US each with unique skills ranging from Geographic Information Systems specialists, financial modellers, project management specialists, retail specialists and report writing specialists.

The goal was to produce a system that could be operated by ICI employees in house at ICI headquarters in Cleveland This parameter raises several questions including:

- How would the system run and on what platform?
- What software would be needed?
- What data would the system use?
- What outputs would the system produce? and
- What staff training would be need to operating the system?

Selected Computer System and project software packages. For ease of use the system had to be PC based and run on a Widows based operating system. This criteria allowed for a wide variety of GIS and financial modelling software packages to be considered for selection as project tools.

The criteria that was used to select software packages revolved around the following criteria:

- Commercial availability;
- Reputation and software functionality;
- Ease of use and learning curve; and
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Using these criteria the GIS selected was MapInfo and the financial modelling software was The Decision Suite by the Palisade Corporation.

What data would you require to do the job and more importantly where to start on a project like this?

The first item on the agenda was to develop a process of what one wanted the «*system*» to do. That sounds easy but required to map out the entire commercial and retail paint buying process in the US including;

- The purchase drivers and repainting rates (interior and exterior) for all commercial and residential markets in the US;
- Identification of and composition by building type (interior and exterior) as to the value of the US commercial paint market by individual market;
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The Project Methodology. The project methodology involved a series of processes including:

Task 1 Determining Market size

1. Determining the total dollar value of the US paint industry and its three components (residential, commercial and industrial paint sales).
2. Rank the various metropolitan paint market locations.
3. Identify, Locate, Map and determine market share for the major paint companies in the United States.
4. Determine the Net Present Value (NPV) for each Metropolitan paint market.

Task 2 Location (Painters, Paint Job Areas, ICI Stores, Competition Stores)

1. Drive time Analysis of current stores.
2. Identify and Analyse Professional Painters across the United States.
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5. Do an ICI store network analysis.
6. Do a Financial Analysis of the existing and proposed new stores.
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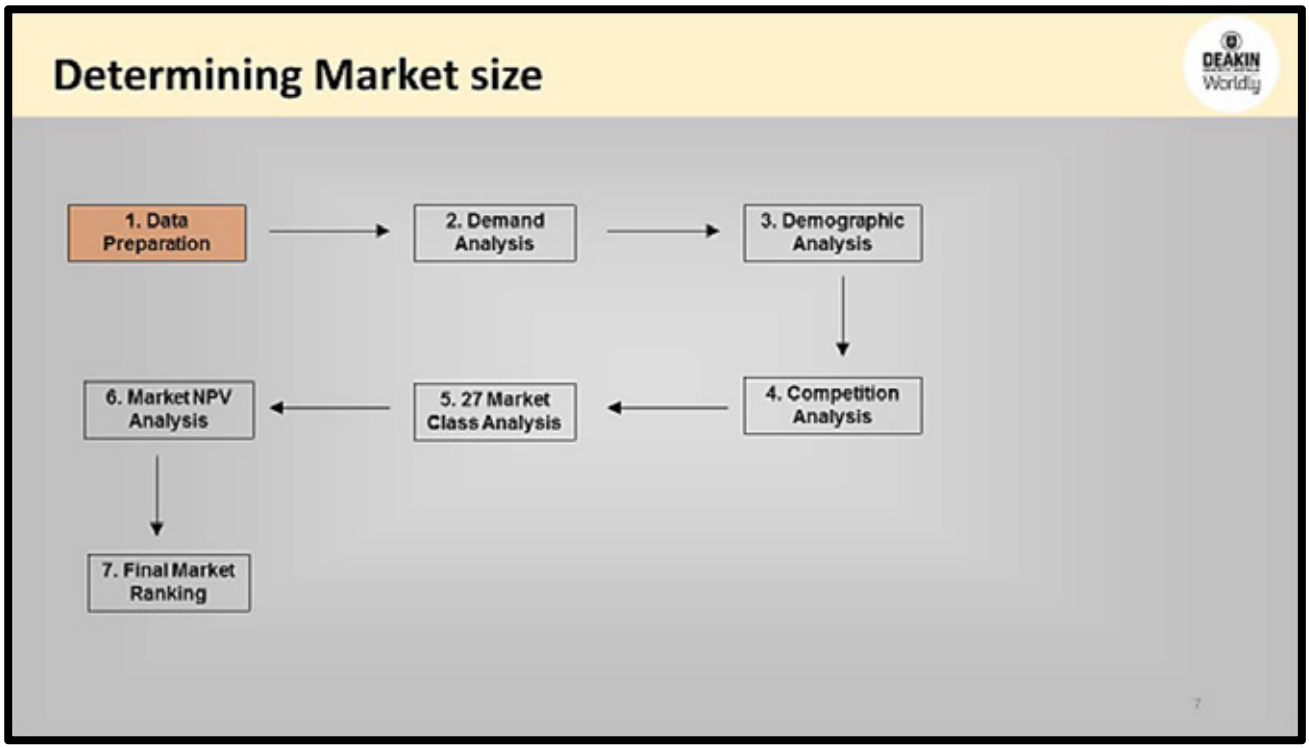
Task

1 Determining the Size of the US Paint Market

The first step in determining the size and extent of the American paint market involved the sourcing of numerous digital US census files and maps. The process is shown in Fig. 1.



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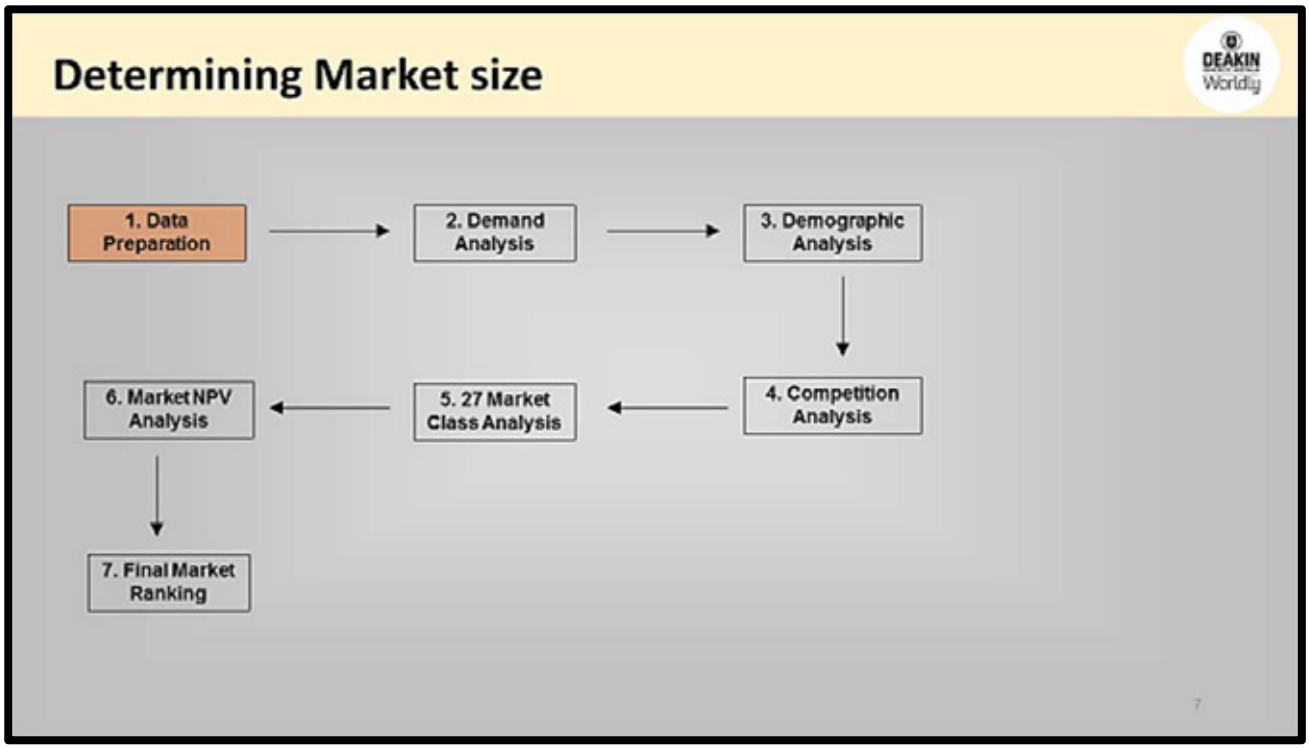


Fig. 1. Determining the Size of the US Paint Market

Data preparation involved loading all the various data into MapInfo and an Access database and geocoding residential paint data into each block groups across the United States. At this time it's worth defining some of the key US demographics terms. The three most relevant terms are shown in Fig. 2.

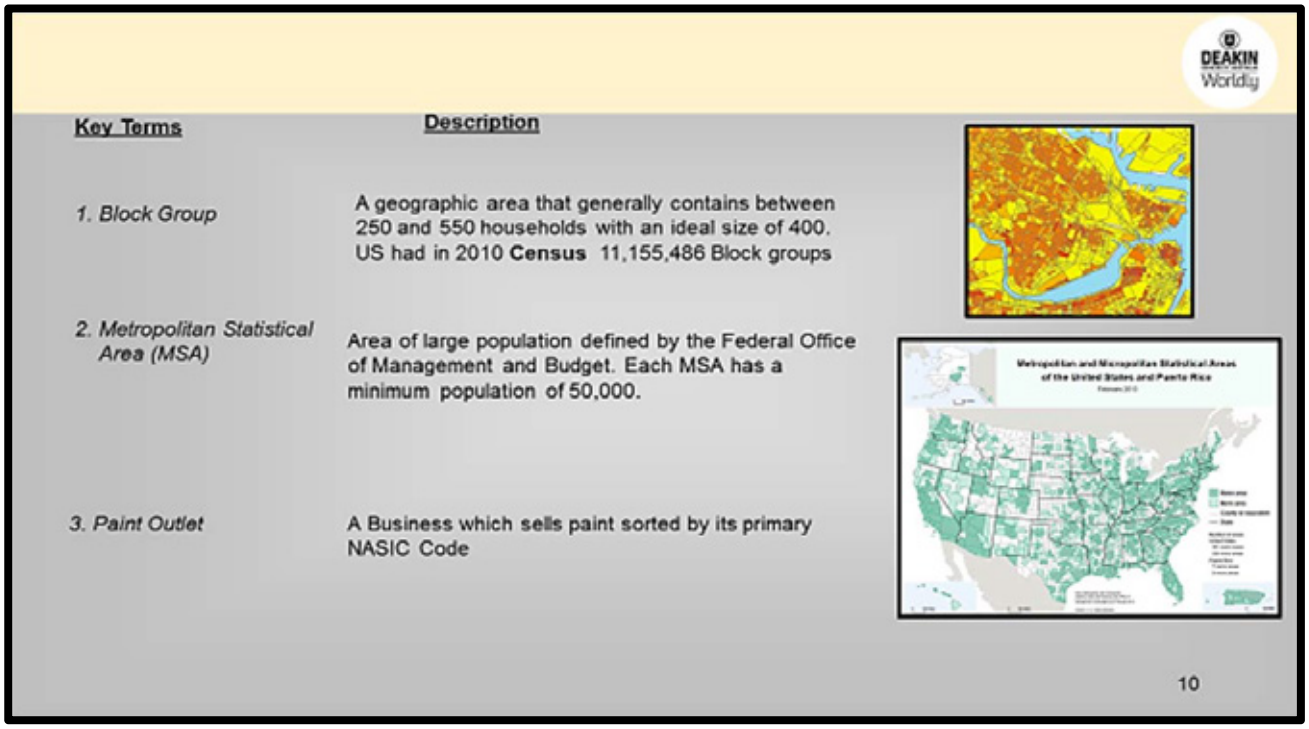


Fig. 2. Key Geographic Terms

The Block Group is the principal geographic reporting area for statistics in the United States and is the principal geographic area that was used for the Store Location System. Key statistics that were captured at the Block level that were critical for this project are shown in Fig. 3.

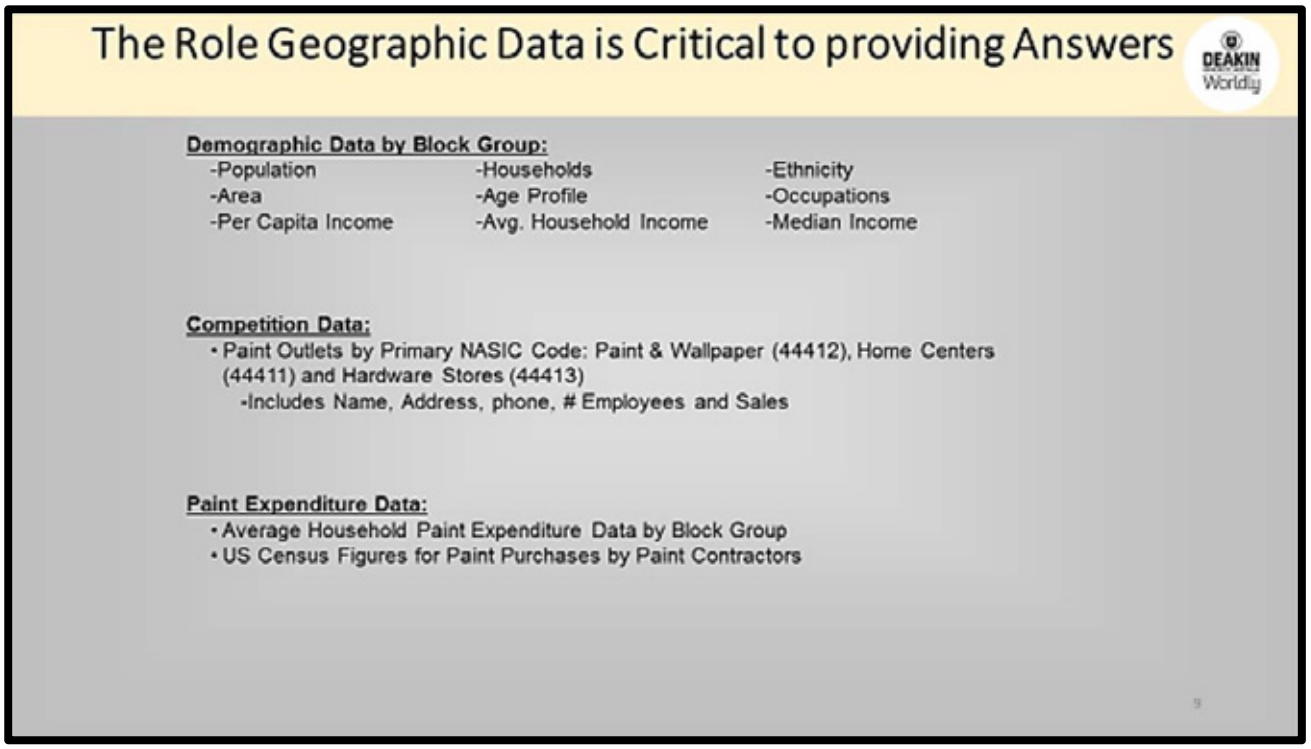


Fig. 3. Critical data used in this ICI Project

Once the initial geographic data was loaded into the GIS the question was what to do with it?

Demographic Analysis

Demographic analysis was performed on both the residential and commercial in the United States. The residential demographic analysis consisted of 7 steps as illustrated in Fig. 4.

A portion of the greater Seattle block group area and the entire Seattle MSA boundary area is shown in Fig. 4.

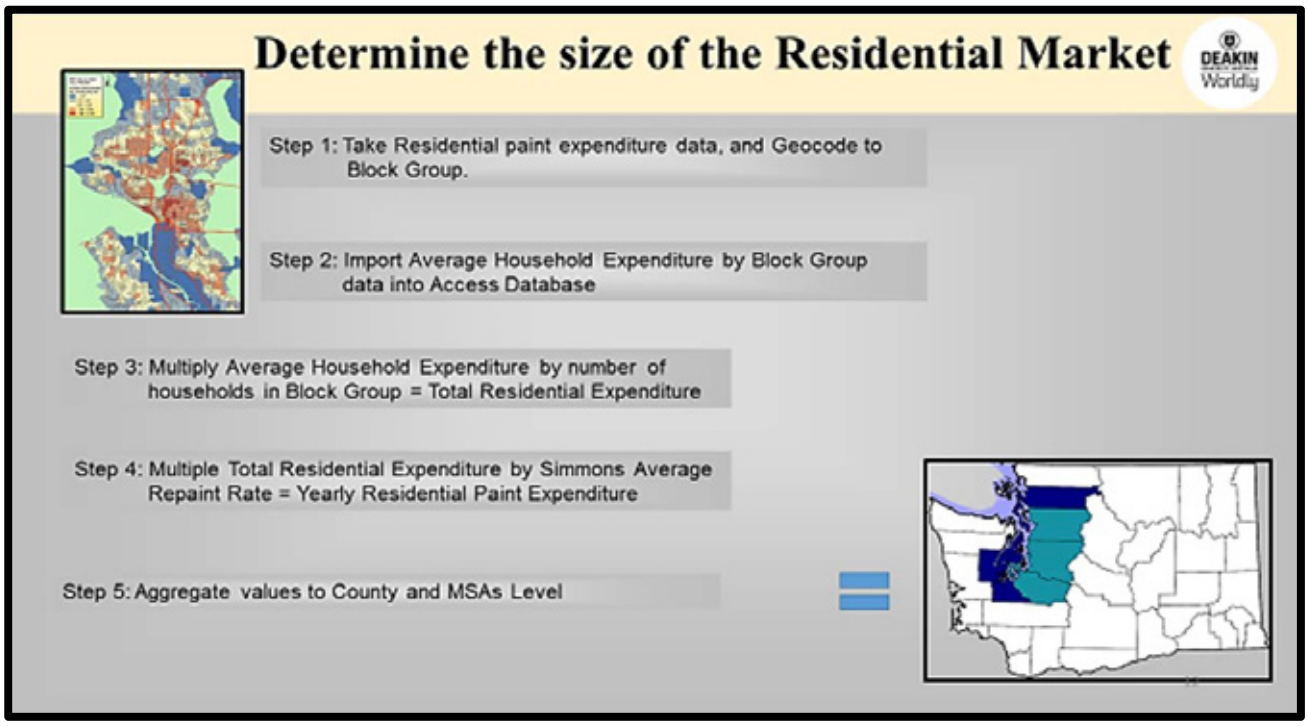


Fig. 4. Residential Demographic Paint Analysis

The residential analysis consists of 5 steps as shown in Figure 4. The commercial demographic analysis consisted of 3 steps as illustrated in Figure 5.

A portion of the greater Seattle block group area and the entire Seattle MSA boundary area is shown in Fig. 5.

In both the residential and commercial block groups results were aggregated to the MSA level. The same methodology was used to determine the residential and commercial paint expenditure in 350 MSA metropolitan areas across the United States.

Once the demographic analysis was completed the next task was to determine how many paint stores there were in the United States, their respective locations and estimated sales turnovers.

The locating and the tallying of the number of paint stores was a simple process. The estimating the store turnover required a series of procedures that would take the information gained from the residential and commercial demographic analysis and apply it to each respective paint outlet in the United States.

Those procedures included:

- Geocoding all paint stores in the United States.
- Do a drive time analysis on the paint stores using 5, 10, 15 and 20 minute timeframes.
- Geocoding all paint contractors in the United States.
- Do a drive time analysis on the painting contractors using 5, 10, 15 and 20 minute timeframes.

Geocoding is the process of converting addresses (like a street address) into geographic coordinates (like latitude and longitude), which you can use to place markers on a map, or position the map. (Fig. 6).

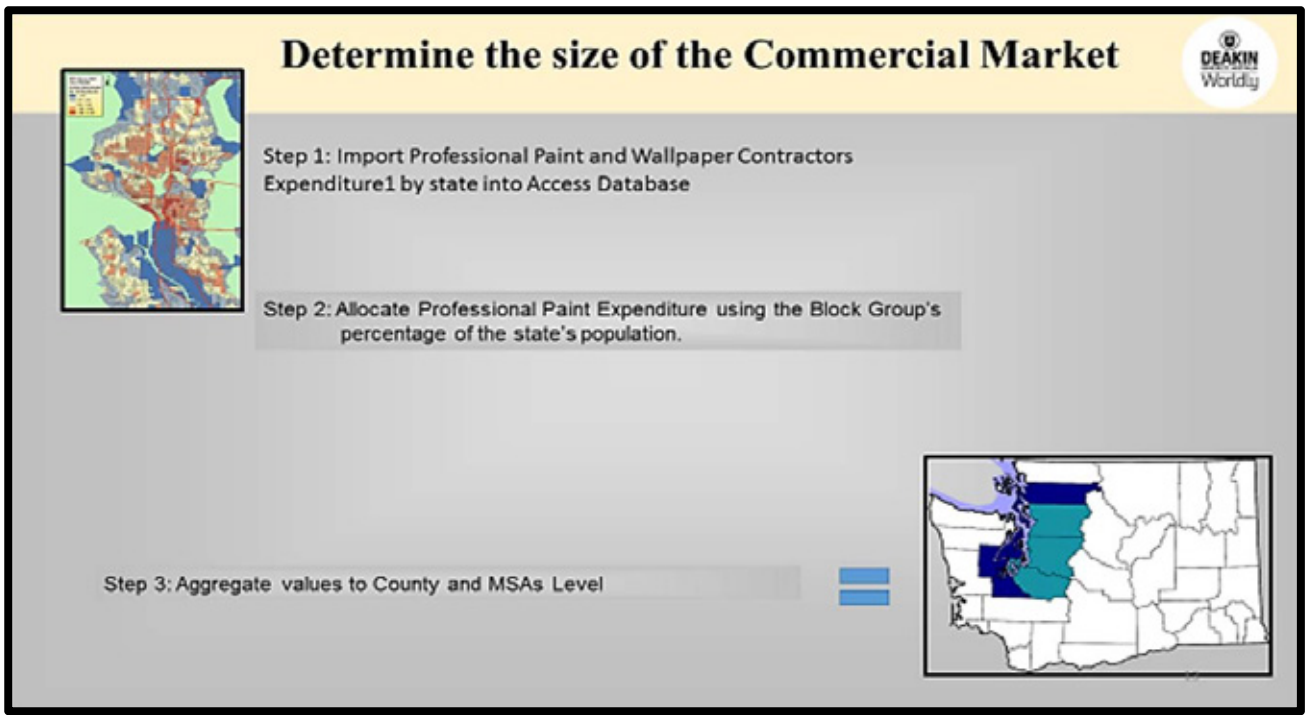


Fig. 5. Commercial/industrial Demographic Paint Analysis

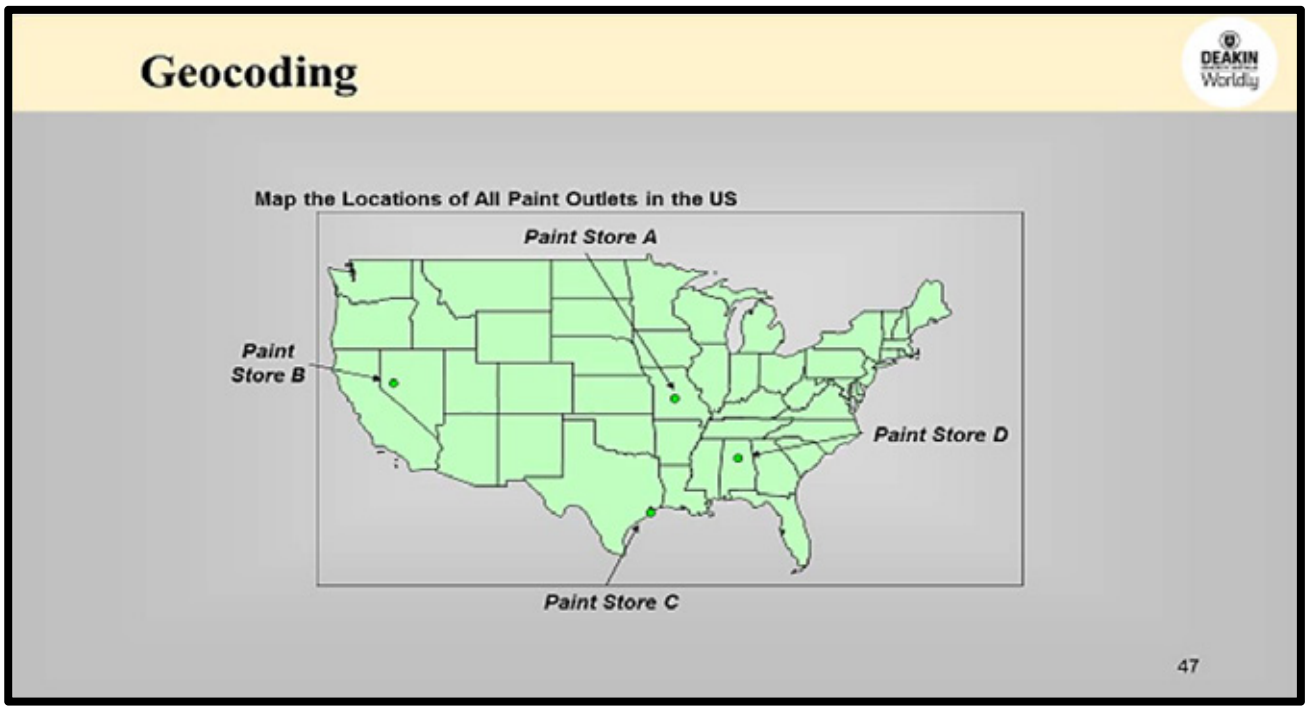


Fig. 6. Geocoding All Paint Stores

Once the geocoding process was completed the United States was classified in 27 Market classes using demographic analysis. ICI store profit and market share percentage was also calculated at this point.

The next step was to calculate the Net Present Value (NPV) for the paint sales in each of the ICI paint stores as shown in Fig. 7.

The final product was an MSA market ranking which ranked all 350 markets as to residential and commercial/industrial estimated sales values as shown in Fig. 6. The ranking also included the NPV value for each ICI Store and for the 350 MSA markets.

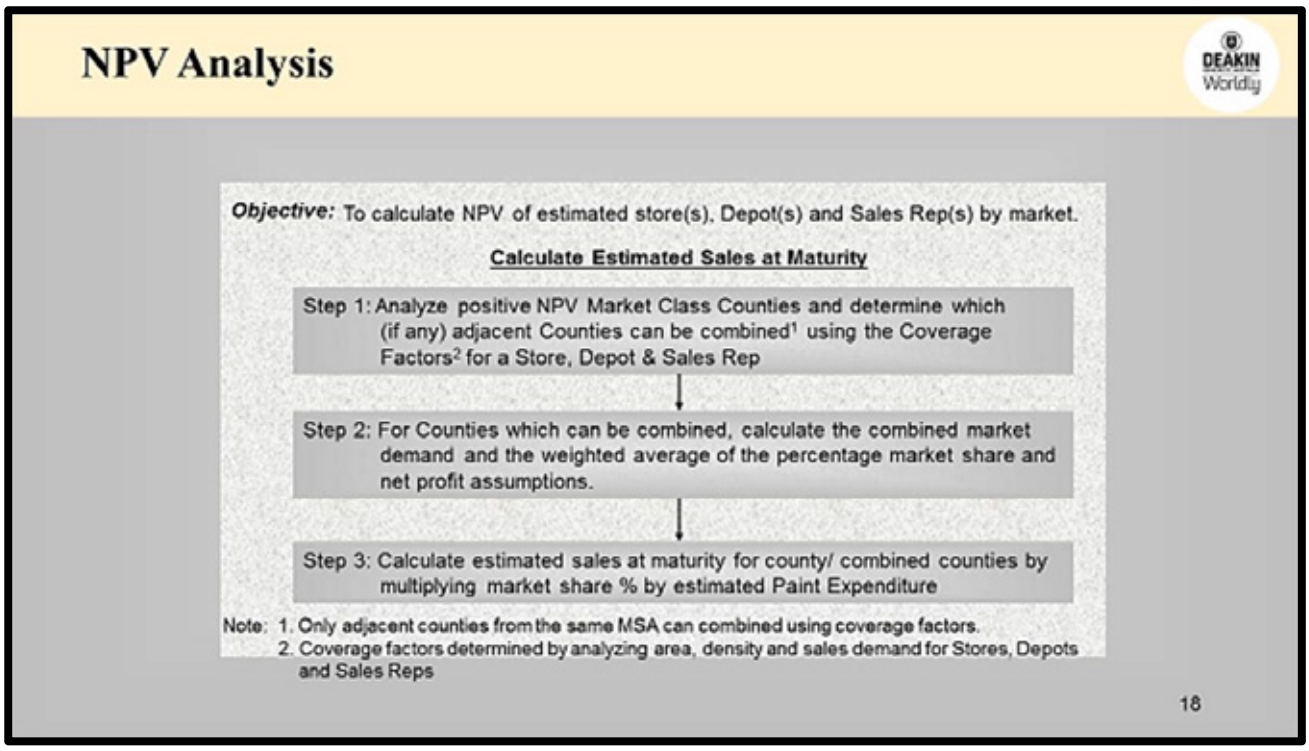
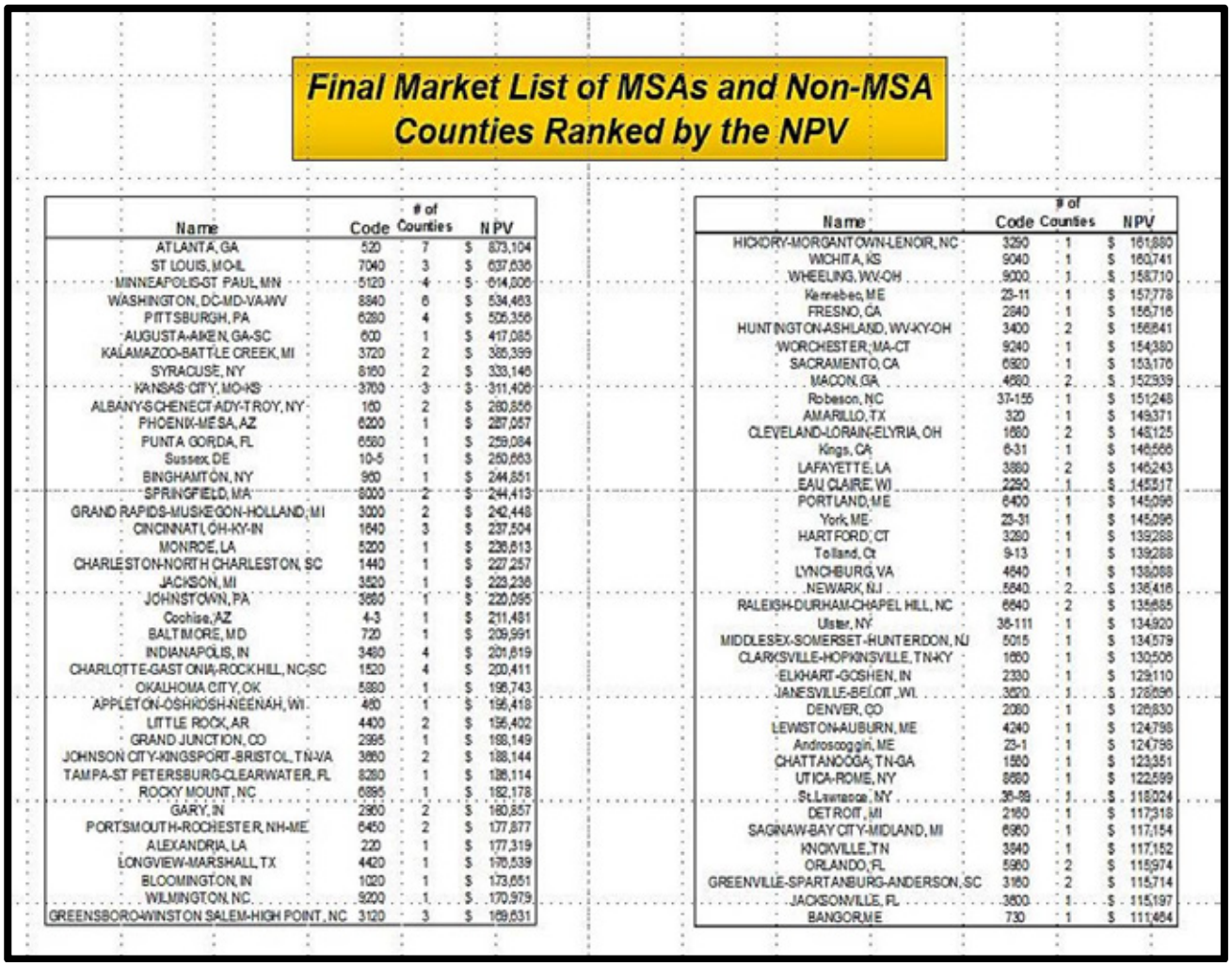


Fig. 7. NPV Value for Paint Stores



Name	Code	# of Counties	NPV
ATLANTA, GA	520	7	$ 873,104
ST LOUIS, MO-IL	7040	3	$ 637,636
MINNEAPOLIS-ST PAUL, MN	5120	4	$ 614,006
WASHINGTON, DC-MD-VA-WV	8840	6	$ 534,463
PITTSBURGH, PA	6280	4	$ 505,356
AUGUSTA-AIKEN, GA-SC	600	1	$ 417,085
KALAMAZOO-BATTLE CREEK, MI	3720	2	$ 385,399
SYRACUSE, NY	8160	2	$ 333,146
KANSAS CITY, MO-KS	3760	3	$ 311,406
ALBANY-SCHENECTADY-TROY, NY	160	2	$ 260,856
PHOENIX-MESA, AZ	6200	1	$ 257,057
PUNTA GORDA, FL	6560	1	$ 256,084
Sussex, DE	10-5	1	$ 250,663
BINGHAMTON, NY	960	1	$ 244,851
SPRINGFIELD, MA	8000	2	$ 244,413
GRAND RAPIDS-MUSKEGON-HOLLAND, MI	3000	2	$ 242,448
CINCINNATI, OH-KY-IN	1640	3	$ 237,504
MONROE, LA	5200	1	$ 236,613
CHARLESTON-NORTH CHARLESTON, SC	1440	1	$ 227,257
JACKSON, MI	3520	1	$ 223,236
JOHNSTOWN, PA	3660	1	$ 220,095
Cochise, AZ	4-3	1	$ 211,481
BALTIMORE, MD	720	1	$ 209,991
INDIANAPOLIS, IN	3480	4	$ 201,819
CHARLOTTE-GASTONIA-ROCK HILL, NC-SC	1520	4	$ 200,411
OKLAHOMA CITY, OK	5880	1	$ 195,743
APPLETON-OSHKOSH-NEENAH, WI	480	1	$ 195,418
LITTLE ROCK, AR	4400	2	$ 195,402
GRAND JUNCTION, CO	2995	1	$ 188,149
JOHNSON CITY-KINGSPORT-BRISTOL, TN-VA	3660	2	$ 188,144
TAMPA-ST PETERSBURG-CLEARWATER, FL	8280	1	$ 186,114
ROCKY MOUNT, NC	6895	1	$ 182,178
GARY, IN	2960	2	$ 180,857
PORTSMOUTH-ROCHESTER, NH-ME	6450	2	$ 177,877
ALEXANDRIA, LA	220	1	$ 177,319
LONGVIEW-MARSHALL, TX	4420	1	$ 176,539
BLOOMINGTON, IN	1020	1	$ 173,651
WILMINGTON, NC	9200	1	$ 170,979
GREENSBORO-WINSTON SALEM-HIGH POINT, NC	3120	3	$ 169,631

Name	Code	# of Counties	NPV
HICKORY-MORGANTOWN-LENOIR, NC	3290	1	$ 161,880
WICHITA, KS	9040	1	$ 160,741
WHEELING, WV-OH	9000	1	$ 158,710
Kennebec, ME	23-11	1	$ 157,778
FRESNO, CA	2840	1	$ 156,716
HUNTINGTON-ASHLAND, WV-KY-OH	3400	2	$ 156,641
WORCHESTER, MA-CT	9240	1	$ 154,380
SACRAMENTO, CA	6920	1	$ 153,176
MACON, GA	4680	2	$ 152,939
Robeson, NC	37-155	1	$ 151,248
AMARILLO, TX	320	1	$ 149,371
CLEVELAND-LORAIN-ELYRIA, OH	1680	2	$ 148,125
Kings, CA	6-31	1	$ 146,566
LAFAYETTE, LA	3880	2	$ 146,243
EAU CLAIRE, WI	2250	1	$ 145,517
PORTLAND, ME	6400	1	$ 145,096
York, ME	23-31	1	$ 145,096
HARTFORD, CT	3280	1	$ 139,288
Tolland, Ct	9-13	1	$ 139,288
LYNCHBURG, VA	4640	1	$ 138,088
NEWARK, NJ	5640	2	$ 136,416
RALEIGH-DURHAM-CHAPEL HILL, NC	6640	2	$ 135,685
Ulster, NY	36-111	1	$ 134,920
MIDDLESEX-SOMERSET-HUNTERDON, NJ	5015	1	$ 134,579
CLARKSVILLE-HOPKINSVILLE, TN-KY	1600	1	$ 130,506
ELKHART-GOSHEN, IN	2330	1	$ 129,110
JANESVILLE-BELOIT, WI	3920	1	$ 126,696
DENVER, CO	2080	1	$ 126,830
LEWISTON-AUBURN, ME	4240	1	$ 124,798
Androscoggin, ME	23-1	1	$ 124,798
CHATTANOOGA, TN-GA	1560	1	$ 123,351
UTICA-ROME, NY	8560	1	$ 122,599
St.Lawrence, NY	36-89	1	$ 118,024
DETROIT, MI	2160	1	$ 117,318
SAGINAW-BAY CITY-MIDLAND, MI	6960	1	$ 117,154
KNOXVILLE, TN	3840	1	$ 117,152
ORLANDO, FL	5960	2	$ 115,974
GREENVILLE-SPARTANBURG-ANDERSON, SC	3160	2	$ 115,714
JACKSONVILLE, FL	3600	1	$ 115,197
BANGOR, ME	730	1	$ 111,464

Fig. 8. Final Market ranking

Results for Task 1

The US paint market was estimated to a have a value in excess of $3 billion per annum with ICI Paints having a 24% to 26% market share.

Task 2 Location (Painters, Paint Job Areas, ICI Stores, Competition Stores)

The second task involved:

1. Drive times analysis for each Block group in the United States (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins).
2. Identify and Analyse Professional Painters across the United States.
3. Develop Professional Painters Database.
4. Drive time Analysis of professional painters (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins).
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6. Drive time Analysis of current ICI stores (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins).

The purpose of Step 2 is to quantify the dollar value catchment area of each ICI paint store location. Each of the components in Step 2 was done in sequential order to determine whether or not the existing ICI stores were in the right location and whether they were at their optimum financial performance and viability.

The Catchment area process included a series of drive times analysis for each block group and each store. The process is shown in Fig. 9.

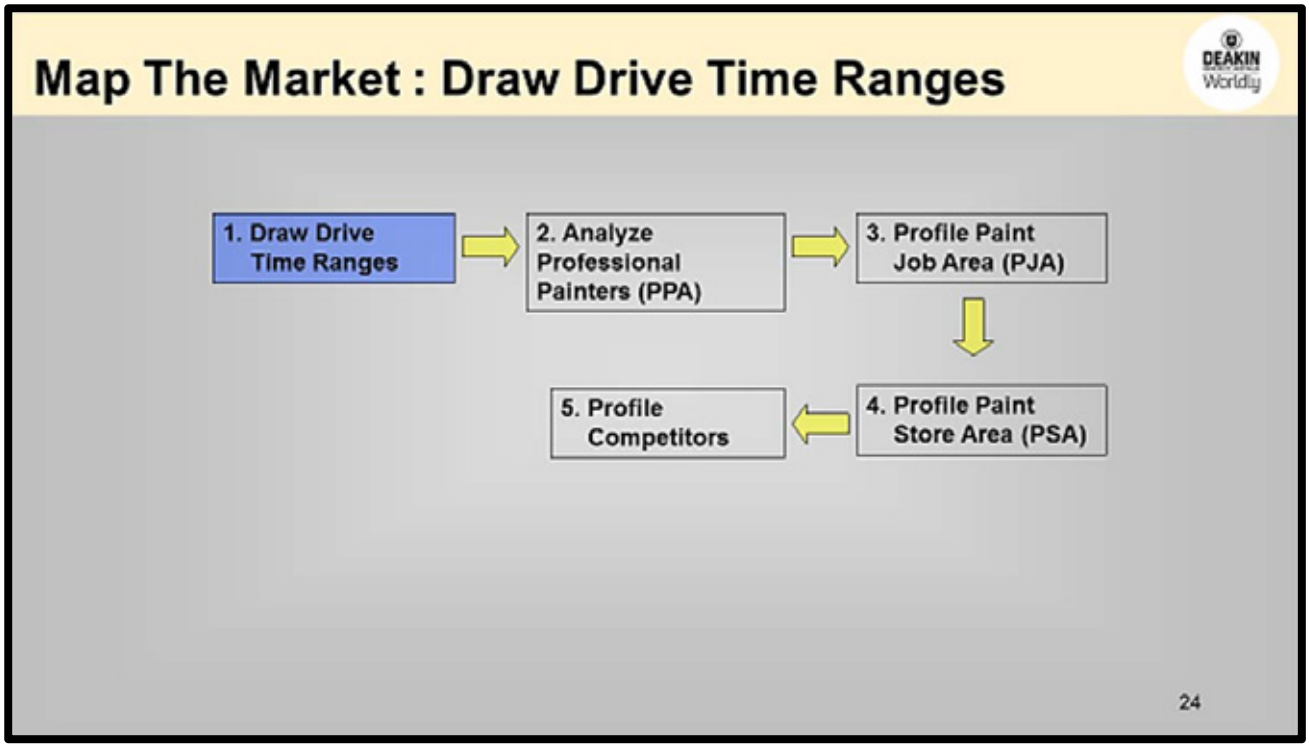

Fig. 9. Draw Drive Times

A series of drive times (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins) for block group were the first to be drawn (Fig. 10).

The reason for doing a drive time analysis for each block group in the 350 MSA market assisted:

- Analysing the existing store(s) profitability.
- Performed a breakeven analysis for store opening and store relocation.
- Determined whether ICI existing store(s) should be kept relocated or closed based on their financial performance.

- Identified existing store(s) market coverage, network gaps and potential new sites.

An example of the block group drive time analysis is shown in Fig. 11.

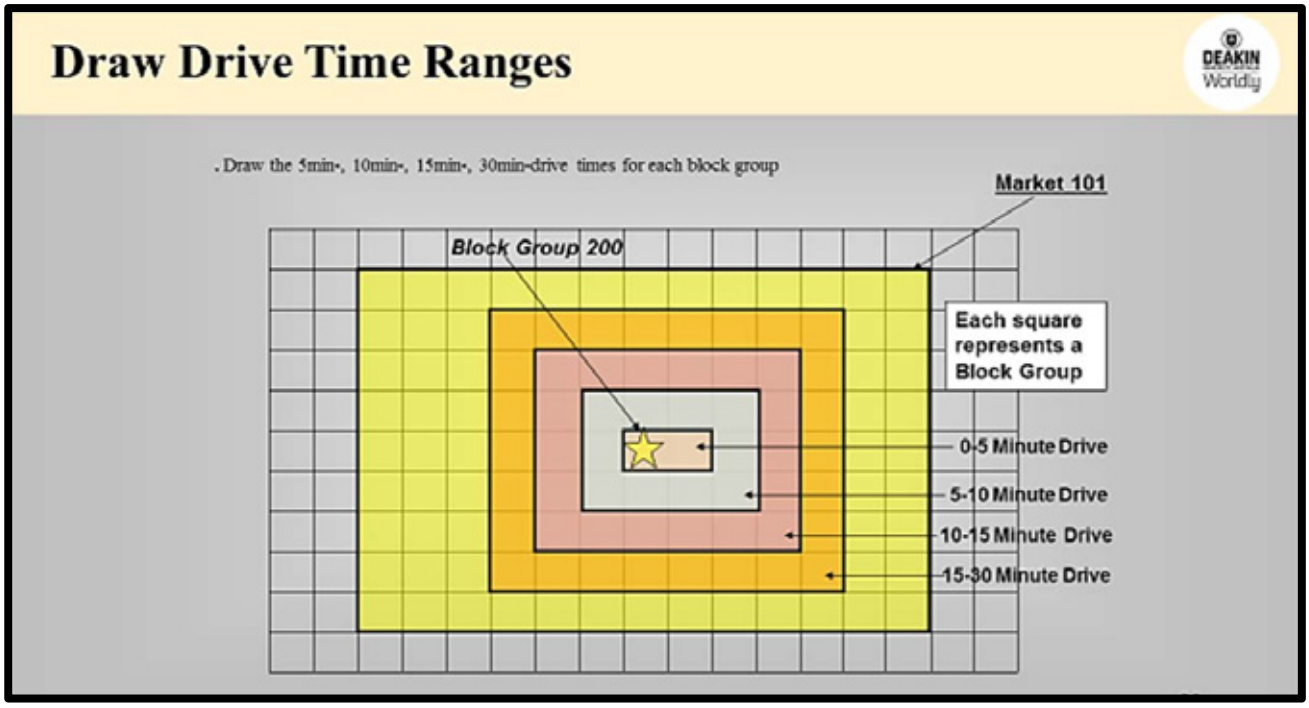

Fig. 10. Block Group Drive Time Ranges

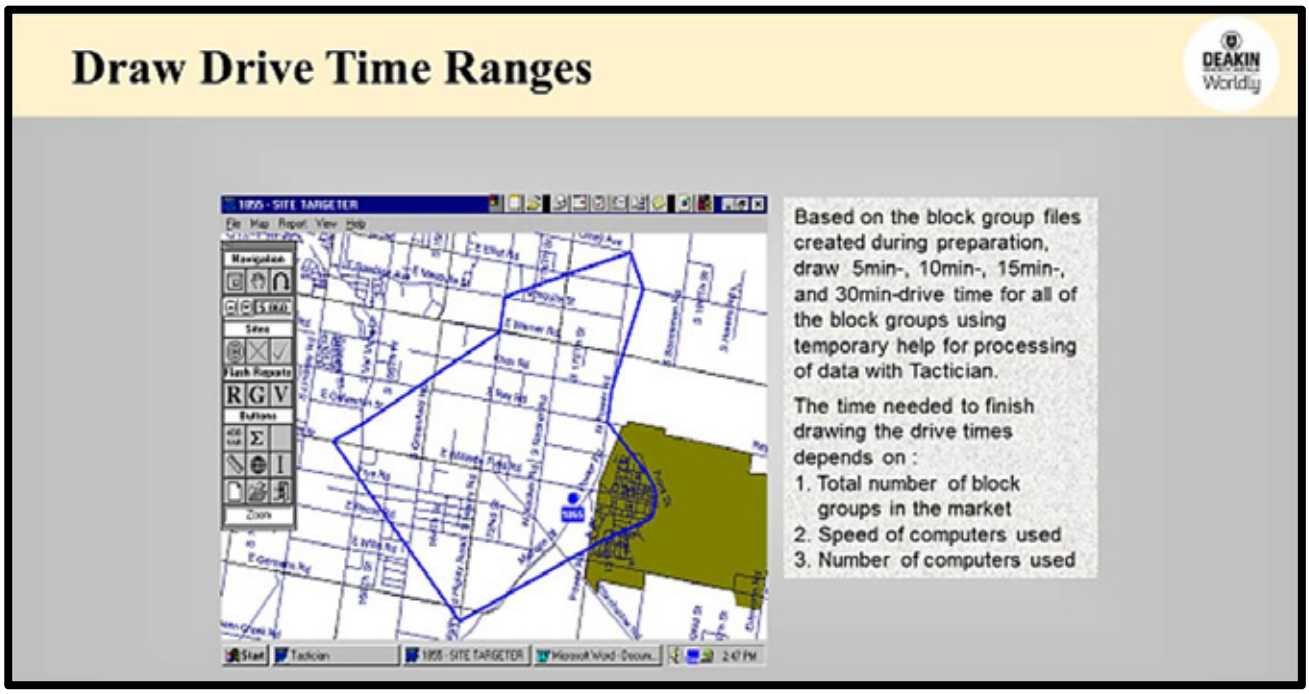

Fig. 11. Block Group Drive Time

Step 2 was to identify quantify and analyse the number of painters per MSA area in the United States. All professional painter information was incorporated into a database that contained the following information (Fig. 12).

A drive time analysis of all professional painters was undertaken to determine the maximum coverage area. This process along with painter surveys and extrapolated sales data allowed the painters to be ranked as to yearly turnover as shown in Fig. 13.

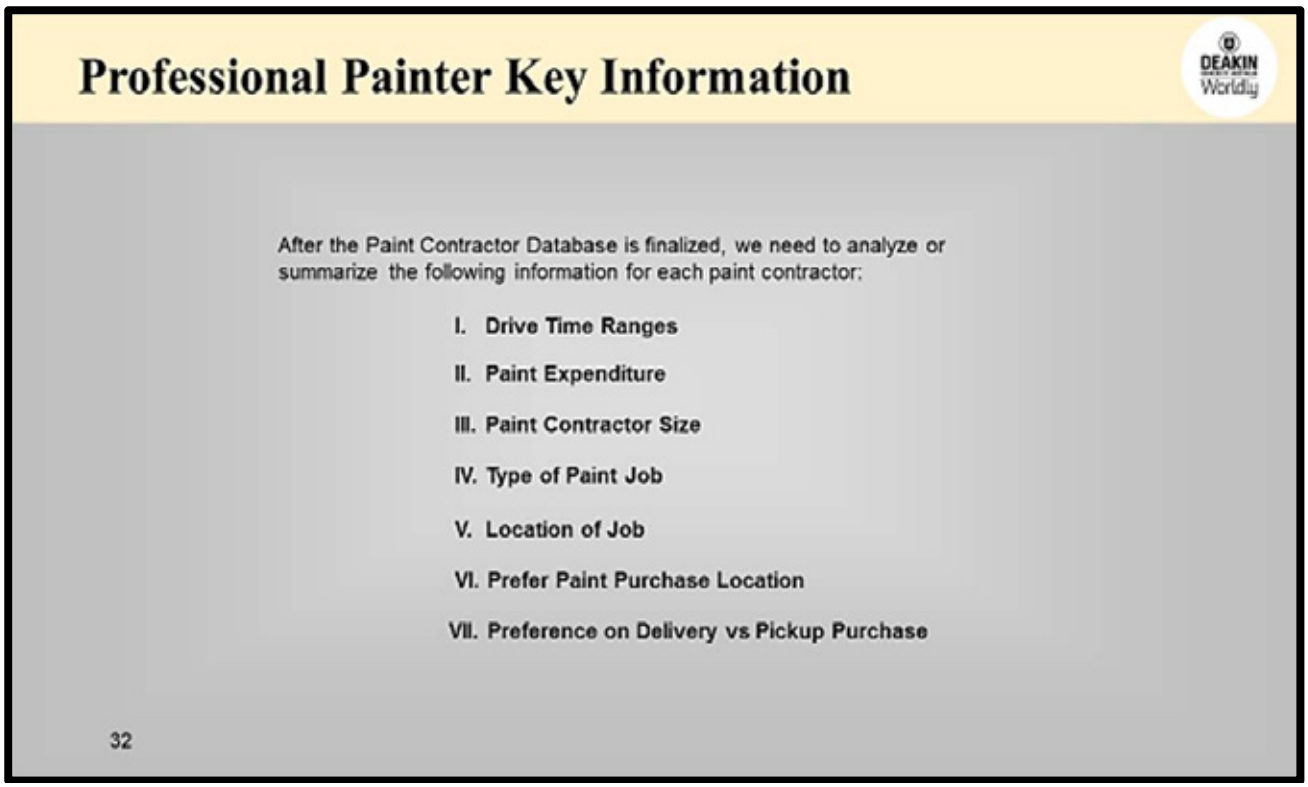

Fig. 12. Information in the Professional Painter Database

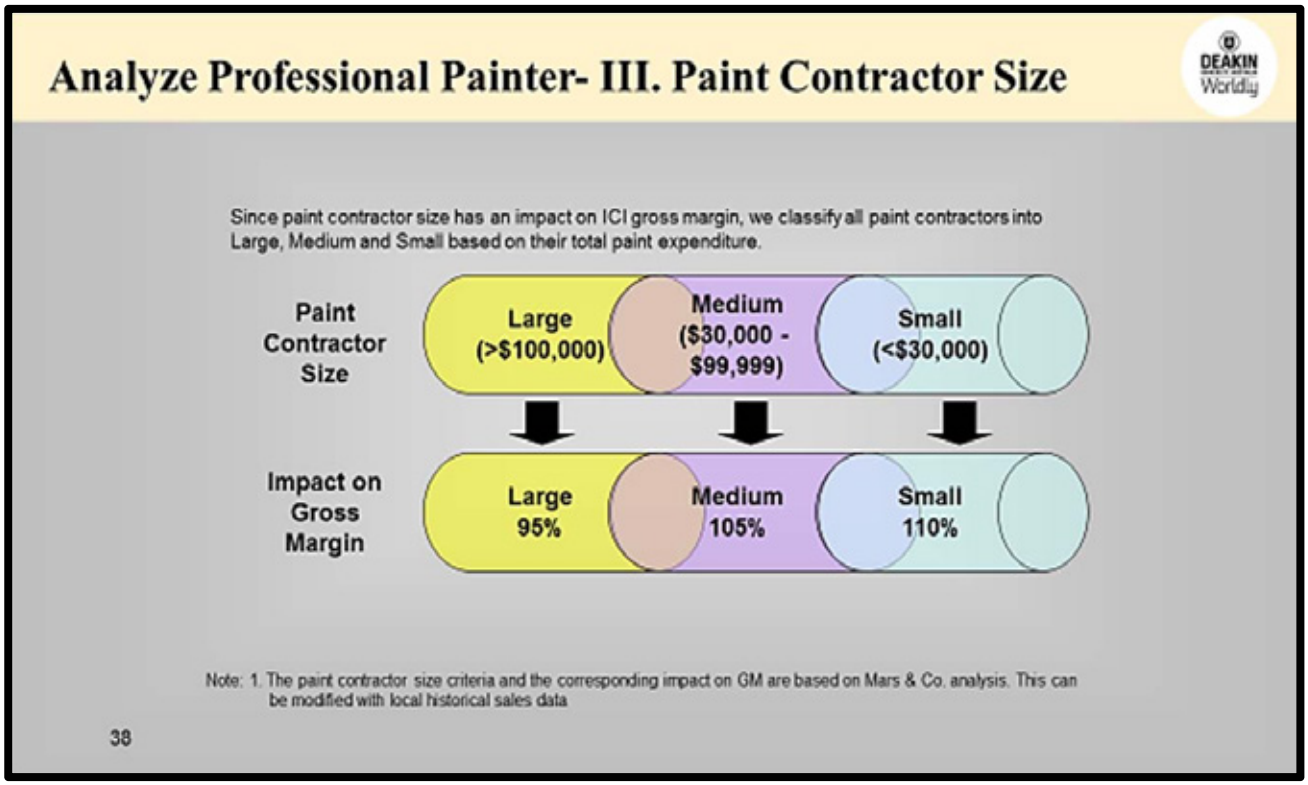

Fig. 13. Paint contractor size

All information gathered on professional painters was contained in a Painter Coverage Model as shown in Fig. 14.

Step 3 was the profiling the MSA paint area. This step involved quantifying the various zoning and building types per block group.

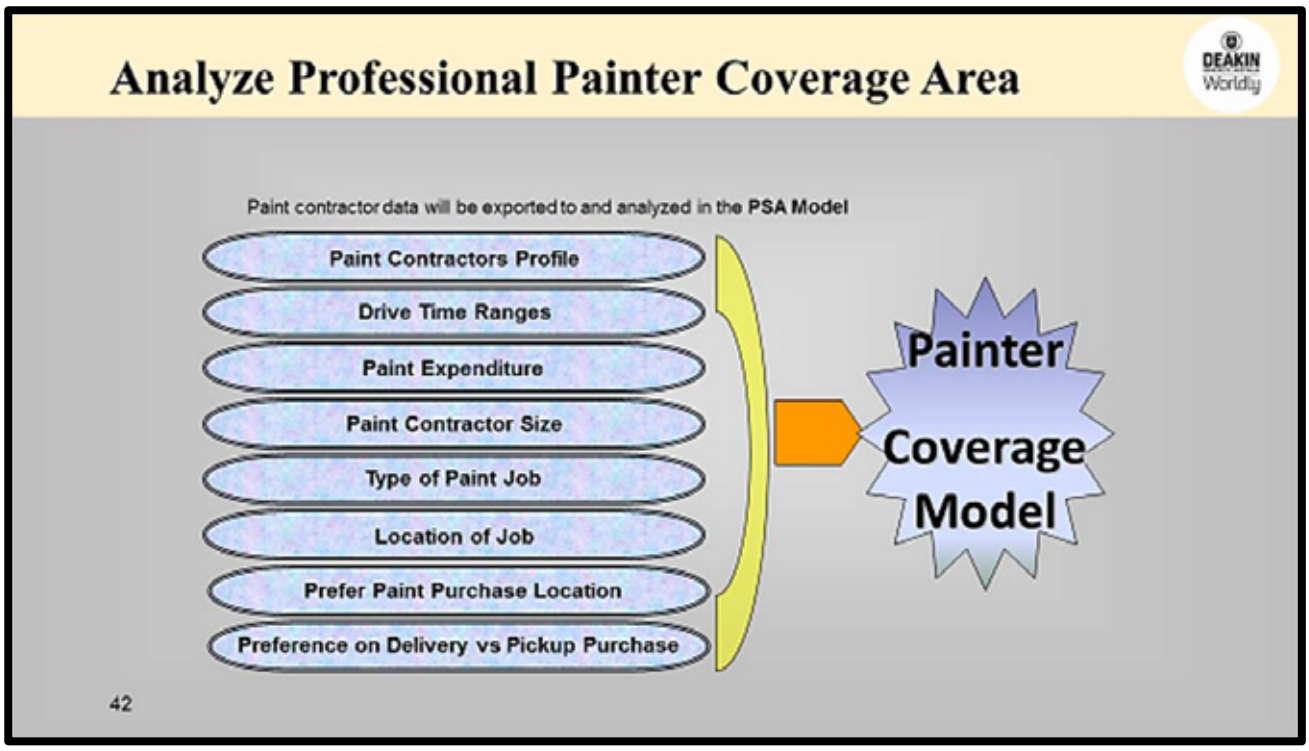

Fig. 14. Professional Painter Coverage Model

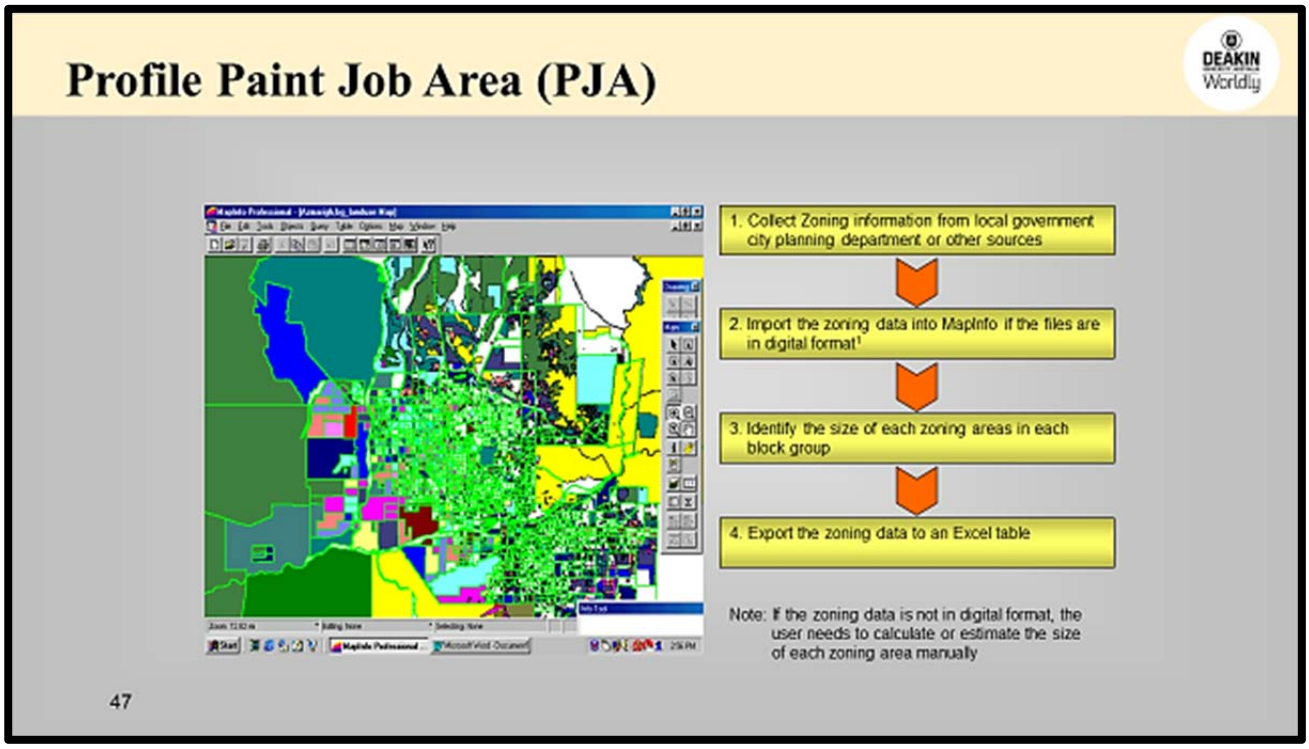

Fig. 15. Profiling the Various Paint areas

The data that was obtained through this process is shown in Fig. 16. As illustrated in Fig. 16 the type of sales segment (i.e. residential, commercial or industrial) was segmented by the various zoning types.

Fig. 17 shows an allocation table indicating the potential commercial paint job area (i.e. the potential total area that could be painted per block group). The information in Fig. 17 directly influences the profitability calculations for each existing paint store.

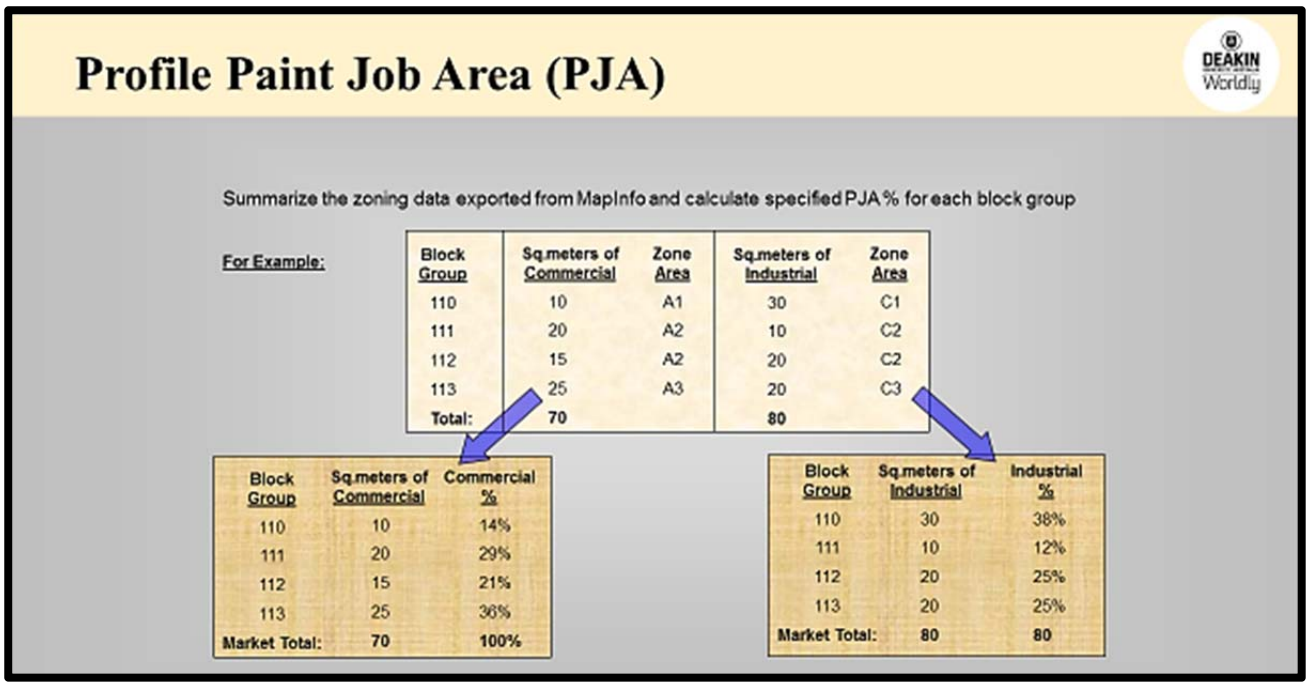

Fig. 16. Summarized zoning data

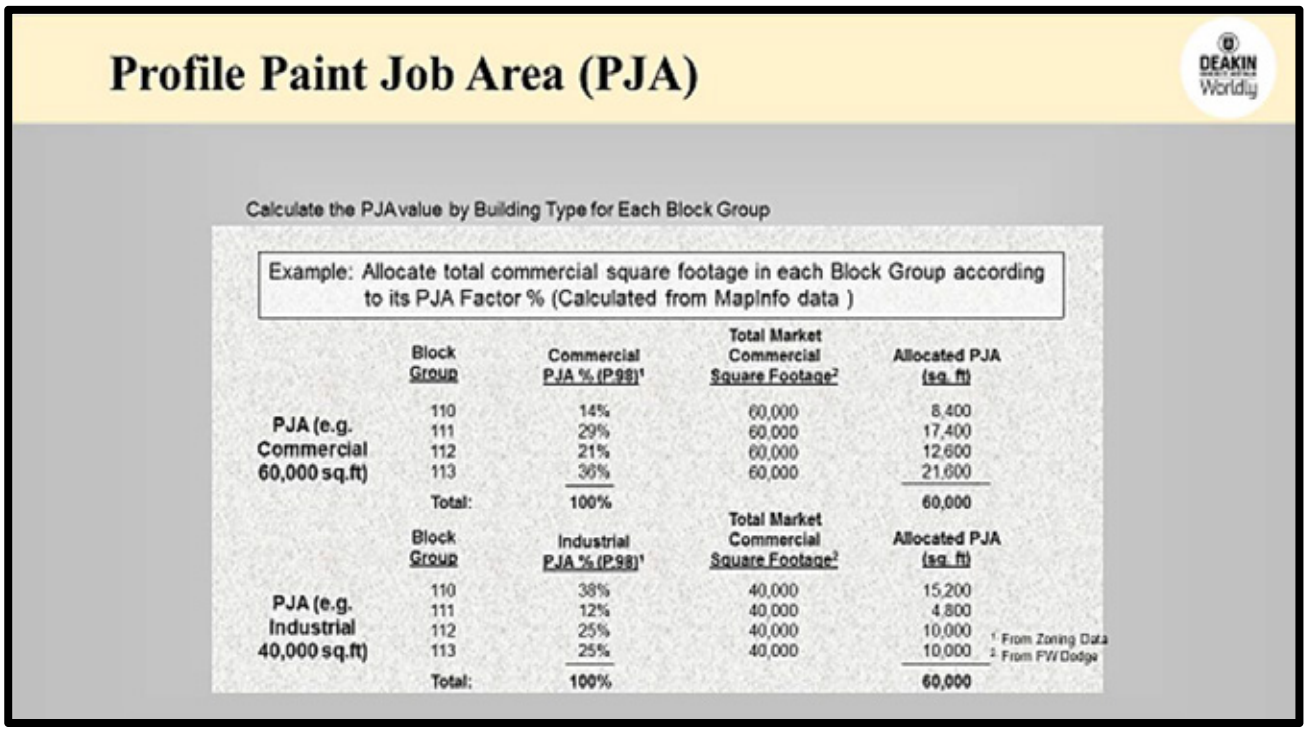

Fig. 17. Building type per Block Group

The results from Fig. 17 influenced or guided the question ***are my current stores in the right or optimal sales location or is there a better location for each ICI store?*** This decision is based on what type of paint market currently exists in each respective store area.

Step 4 shows how each existing paint store will have its own unique store profile. The store profile is comprised of retail and commercial sales. Fig. 18 shows how a store profile is comprised of residential, commercial and industrial sales components.

The residential component is further broken down into single or multi residential dwellings while the commercial component is broken down into public and regular commercial sectors.

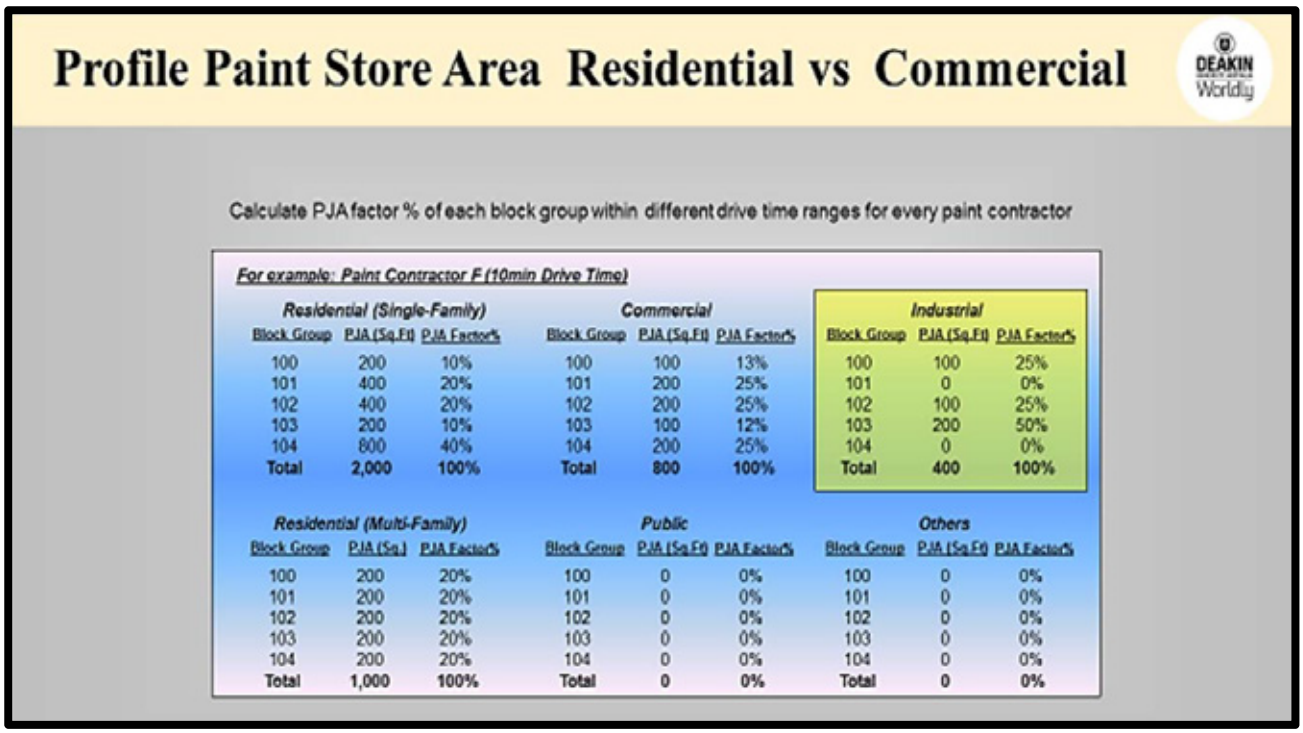

Fig. 18. Residential vs Commercial components

The retail sales component is similar in all stores with the differences occurring in the commercial and industrial components. Fig. 19 highlights the two components of the professional painter commercial and industrial market, delivery sales and pickup sales.

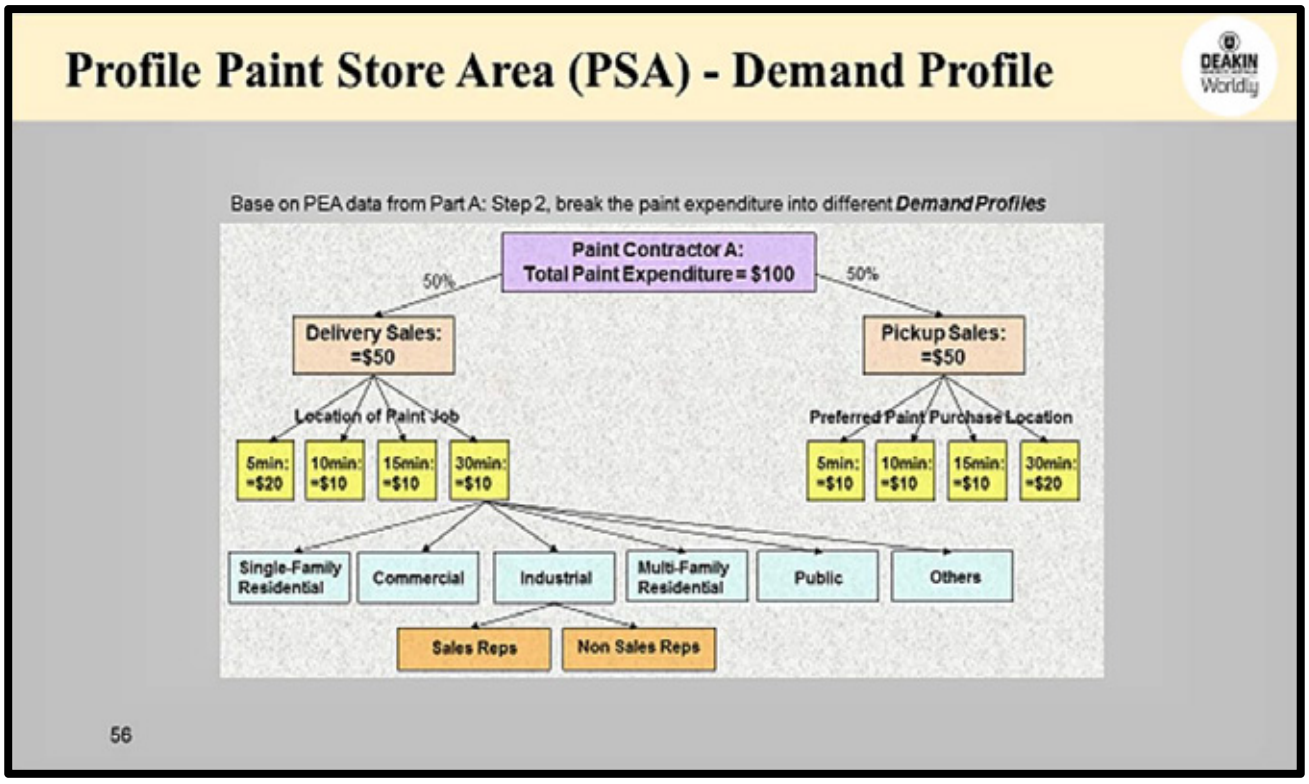

Fig. 19. Commercial and Industrial Sales Profiles

Step 5 is profiling all other paint stores in the 350 MSA's. The process for the task is the same as was used to profile existing ICI stores.

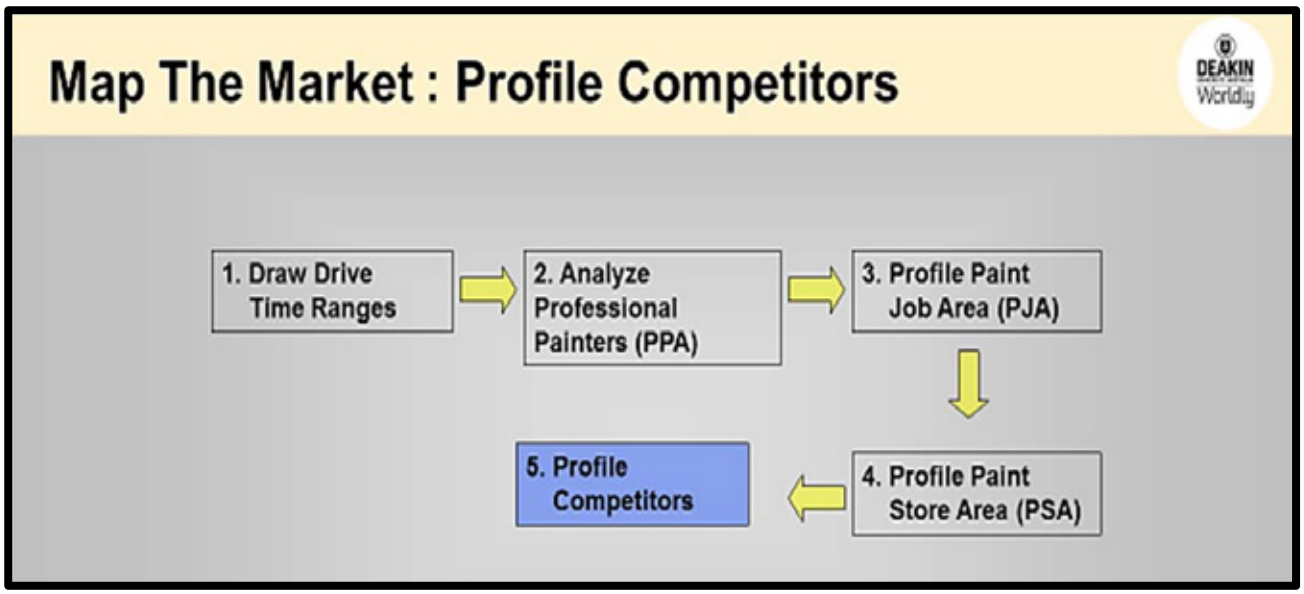

Fig. 20. Profiling Competitors

The process included:

- Identify the location, block group and brand association of each store in each MSA;
- Geocode each store;
- Do a drive time analysis on each store (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins);
- Number of Painters in the competitors area;
- Type of paint jobs in the competitors area; and
- Preference as to Delivery vs Pickup purchases.

Results for Task 2 Location

The results for Step 2 identified every paint store, professional painter and estimated total paint volumes by type of building for 350 MSA areas.

Task 3 Optimal store Location

Task 3 objective is:

- To identify the ideal location(s) for paint store(s); and
- To estimate the impact of the ideal network on ICI's performance in the market.

Step 3 is comprised of 7 steps as shown in Fig. 21. The Competition Analysis is based on existing paint retail outlets' market share, level of competition, drive time ranges, drive time factors, delivery versus pickup sales and PSA value of block groups, estimate the amount of PSA value that each existing paint retail outlet would capture under the competition model.

Task 3 the optimal store location combines the work of Task 1 and Task 2.

Step 1 is to use the geocoded, mapped and drive time data for each paint store in every MSA area.

The next process in Step1 is to determine the volume of Delivery versus Pickup sales volume. Delivery sales refers to products shipped out from the store to the customer site. As long as the store is somewhere within a reasonable distance (current assumption of 30min drive time) from the customer site it is assumed that the store can deliver the product on time. Therefore, the store location in relation to competitors does not matter as long as the site is within the drive time assumptions. Therefore, there is no drive time factor used for delivery sales.

For pickup sales, stores have competitive advantage over other stores if they are closer to the location where a painter prefers to purchase paint. Therefore, a drive time factor is applied to adjust the competitiveness of each store in relation to its drive time factor (e.g. 70% of market share on block groups that are within 10min drive time range of a store site).

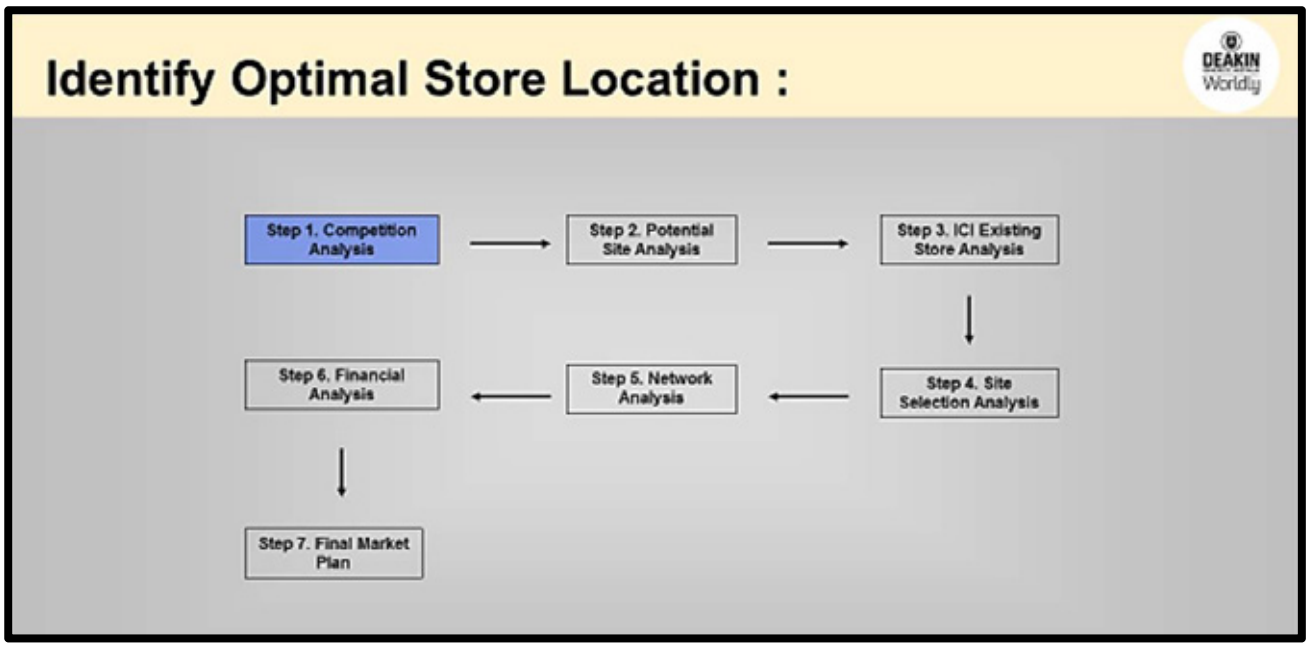

Fig. 21. Optimal Store Location

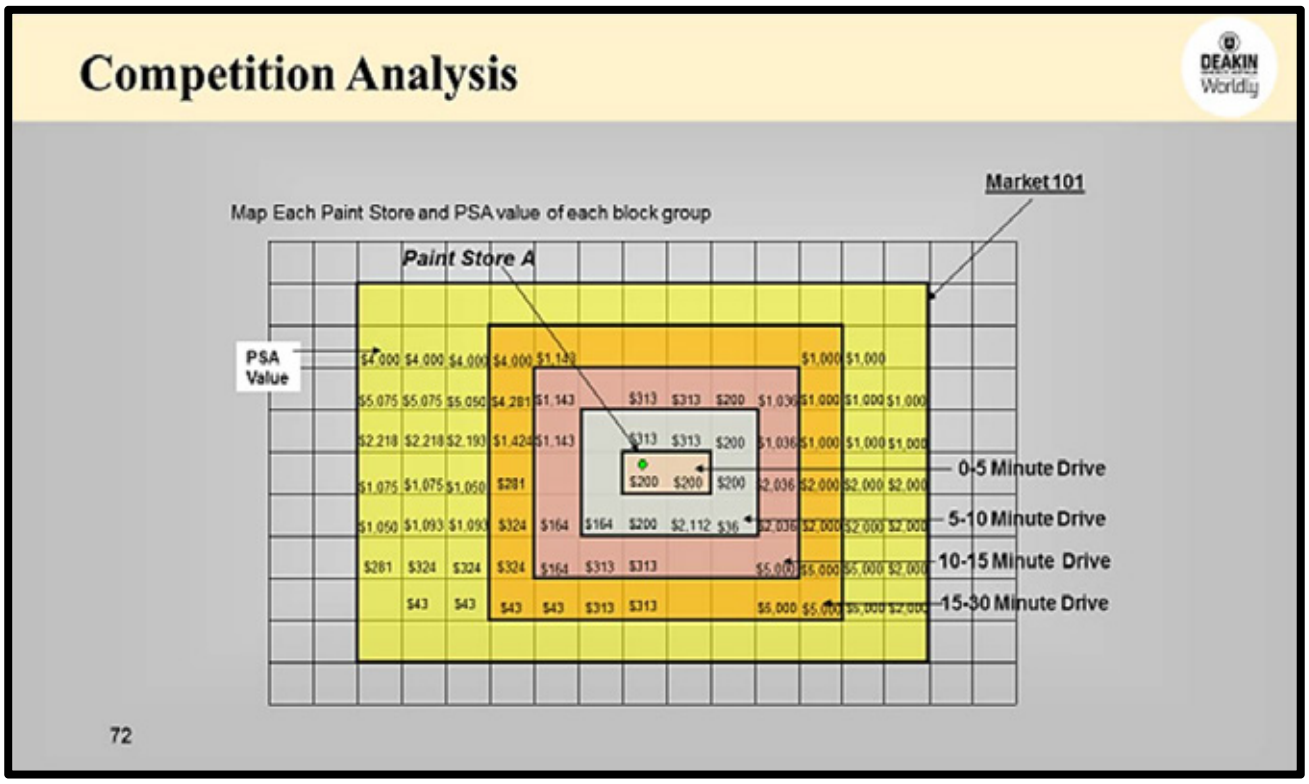

Fig. 22. Drive Time Analysis for all Competition Paint Stores

An example of the impact delivery versus pick up sales would have on an individual stores is shown in Fig. 23.

Step 2 involves potential site analysis where the objective is to calculate the estimated paint sales area value and the corresponding gross margin captured by each potential site. The potential site analysis required mapping all the potential paint stores.

Step 3 involves performing an analysis on existing ICI stores to analyze the existing store(s) profitability. The analysis would determine whether the existing ICI store(s) should be kept, relocated or closed based on their financial performance.

Step 4 involves the selection of the top potential sites and grouping them by location as shown in Fig. 24. The selection is based on area value and growth margin.

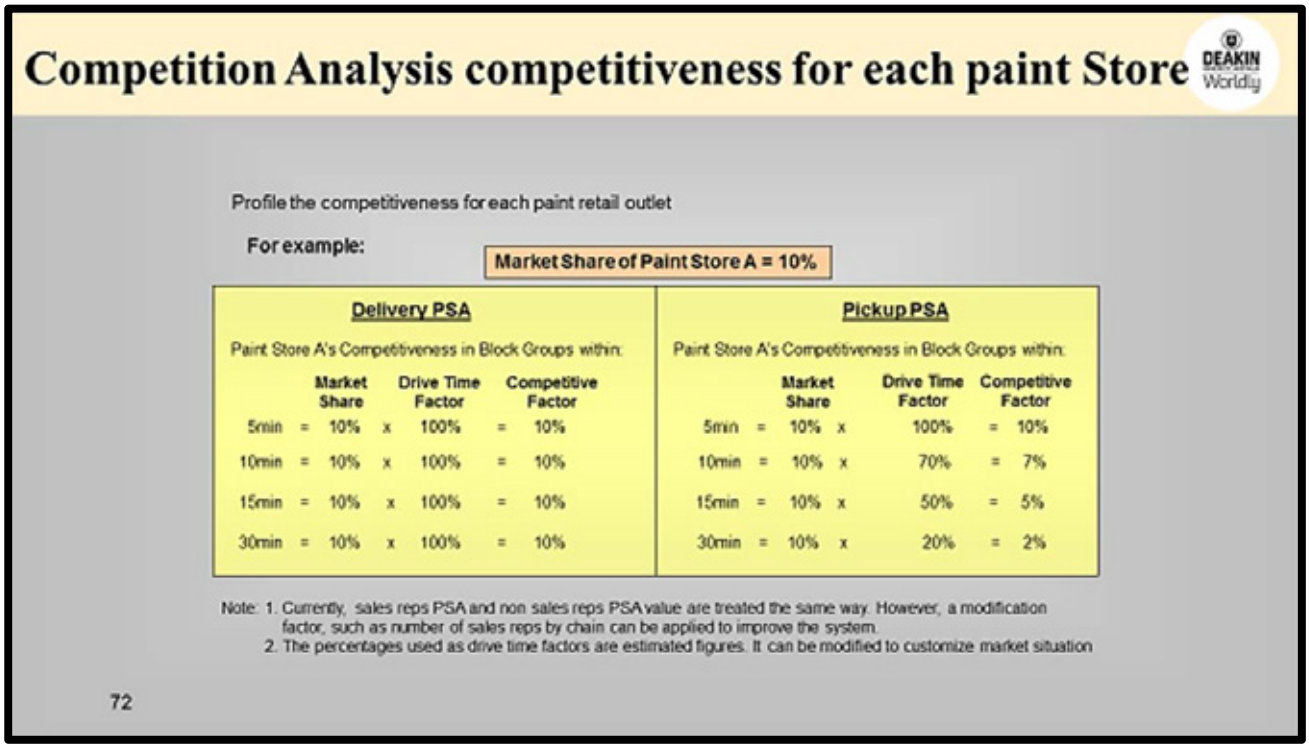

Fig. 23. Delivery vs Pick Sales Impact on Individual Stores

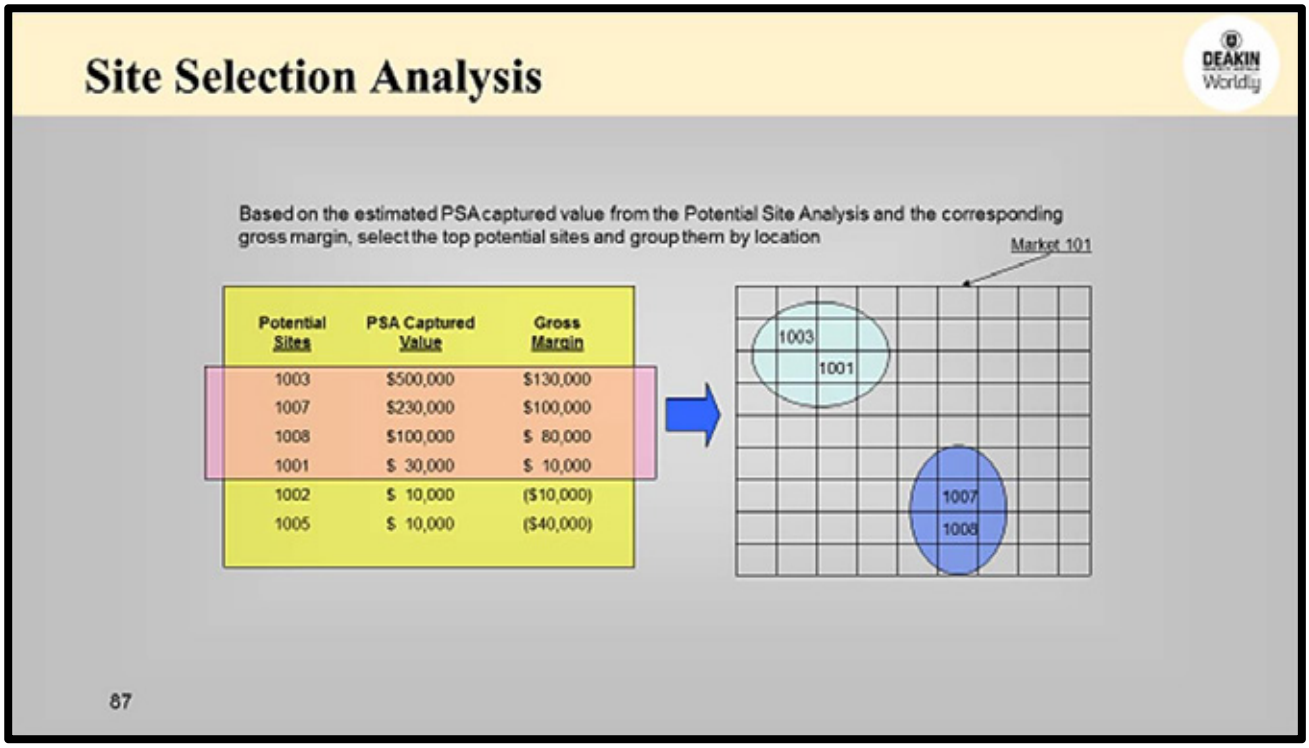

Fig. 24. Site Selection Analysis

Step 5 once the potential sites have been identifies the next step is to perform a network analysis to see what impacts any new stores would have on the existing stores. The criteria used in the network analysis includes:

- Maximizing the market coverage of the store(s).
- Maximize the total network profit and total net present value.
- Minimize the cost incurred for terminating the existing lease(s).
- Maximize capital investment available to open or relocate store(s).

Step 6 involves another financial analysis to see what impacts if any the new and relocated sites would have on the overall financial performance.

Step 7 is the last step in the optimal store location process. That step is to incorporate all of the results (market size, store location, and optimum store network) into the ICI marketing and strategic planning documents.

Conclusions. This paper outlined the methodology that was successfully used to quantify the American retail paint market. ICI used this process to expand its retail network from 2000 through to 2005. In 2008 ICI was sold to AkzoNobel who immediately sold parts of ICI to Henkel, and integrated ICI's remaining operations within its existing organisation. This sale and the associated corporate restructure caused considerable change in marketing directions allowing for the first time the selling of Glidden paint products to mass market centres such as Home Depot.

This change in marketing strategy caused the traditional Glidden retail store network to decline to about 420 stores nation-wide, with the subsequent effect that ICI (Glidden) gave up some of its profit margin to third-partner retailers in exchange for higher sales volume.

УДК 50.03.05 +535.39(81)

М.Р. Арпентьева[1]

ИНТЕРСУБЪЕКТИВНЫЕ ТЕХНОЛОГИИИ ГОСУДАРСТВЕННОГО УПРАВЛЕНИЯ

Резюме. *В работе анализируются особенности интерсубъективных технологий государственного управления. Обсуждаются отличительные особенности и достоинства интерсубъективных технологий государственного управления, сформулированные на основе эвергетической модели государственного управления. Отмечается, что полилогические или мультиакторные, полностью децентрализованные сети в управлении и обучении, иных сферах жизни человека превосходят в скорости и качестве решений монологические: привлечение граждан в том числе гражданского общества к управлению государством позволяет не только снизить напряженность отношений между классами и группами, руководящим монолитом и гражданами, но и со временем отказаться от привычных форм государственного управления в пользу управления интерсубъективного. Эвергетика исходит из «суперпозиции» субъекта и объекта управления, «неоднородности» сообществ и акторов, выступающих и как исследователи, и как субъекты, участвующие в принятии решений, субъект и творит, и познает мир: актор находится «внутри» объекта (общества) и коммуницирует с другими акторами в общей для них проблемной жизненной ситуации. Представления эвергетики о продуктивности мультиагентных и мультиакторных технологий управления могут служить основой для построения типологии и разработки единой схемы интерсубъективного управления государством.*

Ключевые слова: *интерсубъективные технологии, государственное управление, мультиакторное управление, моноакторное управление.*

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Data preparation involved loading all the various data into MapInfo and an Access database and geocoding residential paint data into each block groups across the United States. At this time it's worth defining some of the key US demographics terms. The three most relevant terms are shown in Fig. 2.

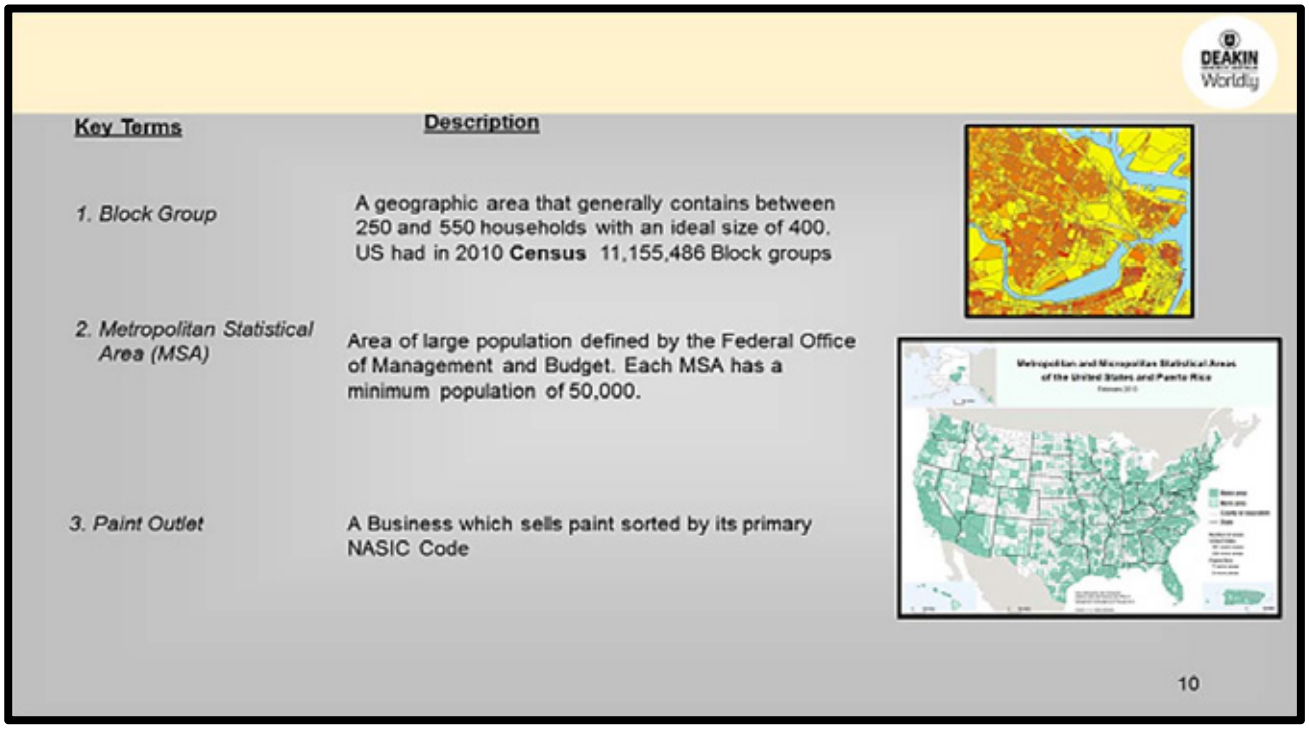


Fig. 2. Key Geographic Terms

The Block Group is the principal geographic reporting area for statistics in the United States and is the principal geographic area that was used for the Store Location System. Key statistics that were captured at the Block level that were critical for this project are shown in Fig. 3.

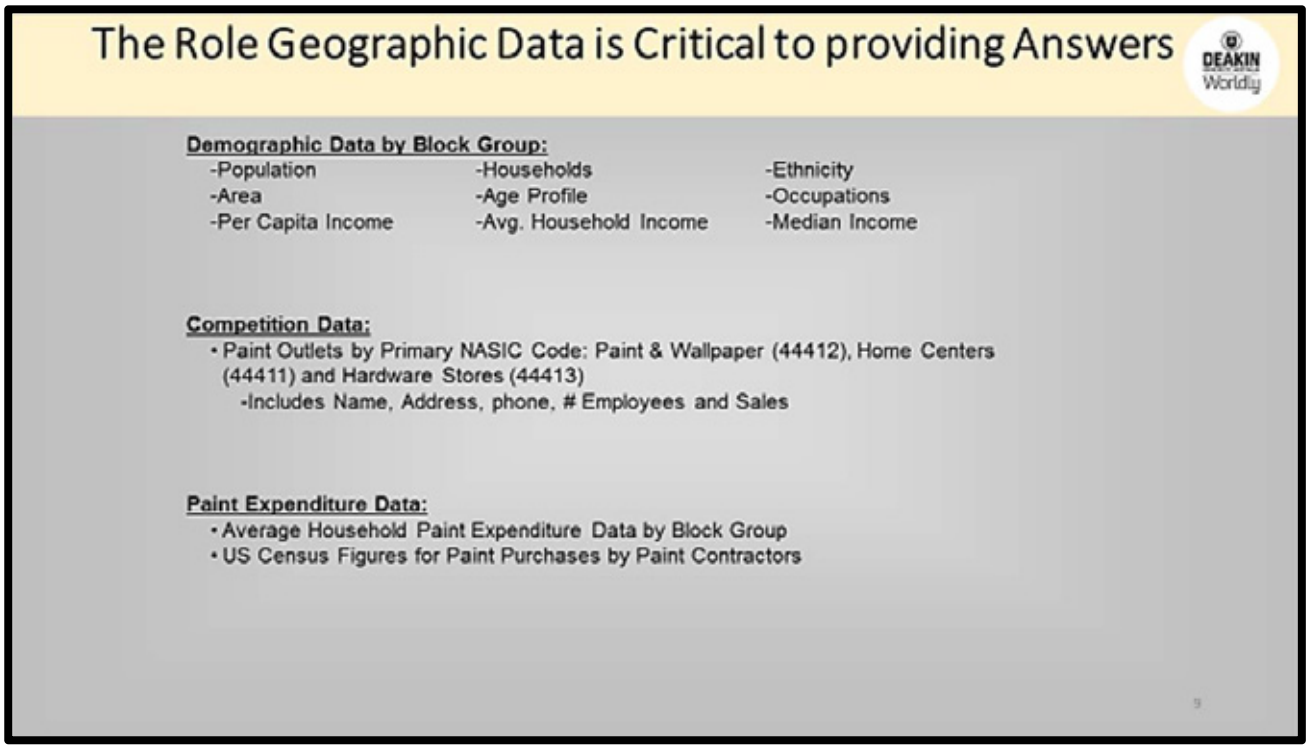


Fig. 3. Critical data used in this ICI Project

Once the initial geographic data was loaded into the GIS the question was what to do with it?

Demographic Analysis

Demographic analysis was performed on both the residential and commercial in the United States. The residential demographic analysis consisted of 7 steps as illustrated in Fig. 4.

A portion of the greater Seattle block group area and the entire Seattle MSA boundary area is shown in Fig. 4.

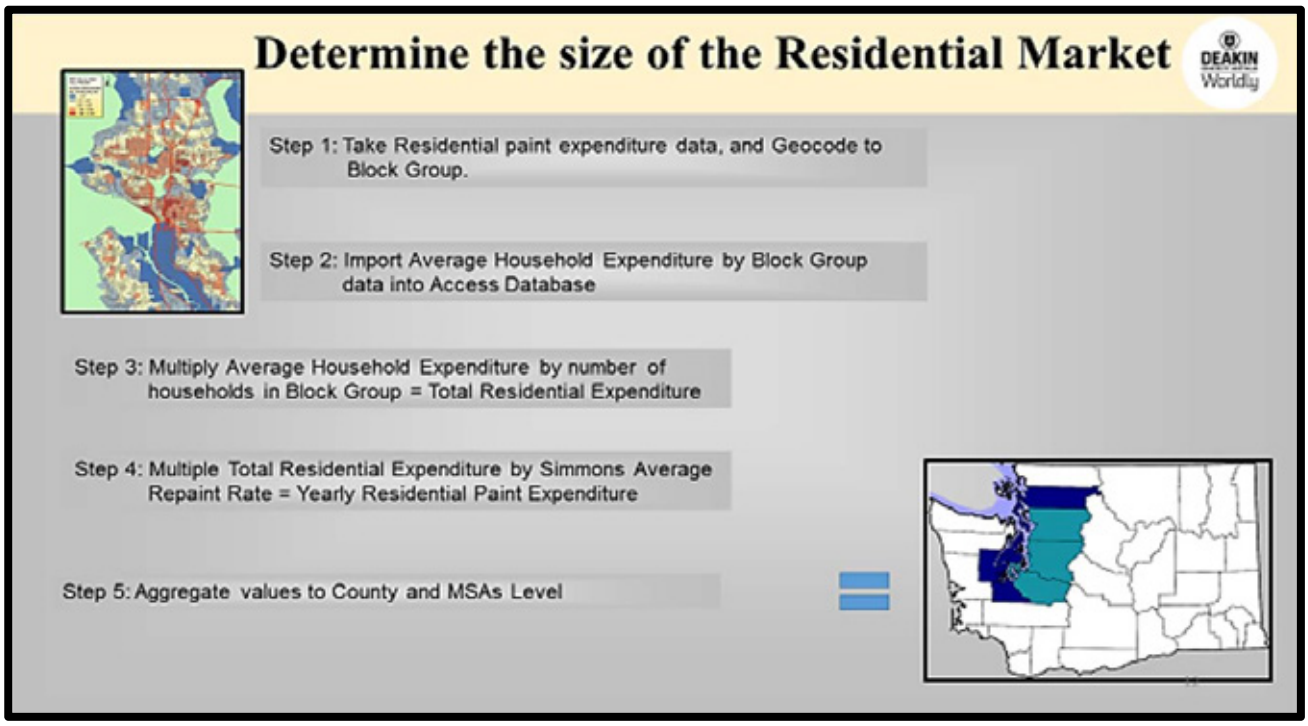


Fig. 4. Residential Demographic Paint Analysis

The residential analysis consists of 5 steps as shown in Figure 4. The commercial demographic analysis consisted of 3 steps as illustrated in Figure 5.

A portion of the greater Seattle block group area and the entire Seattle MSA boundary area is shown in Fig. 5.

In both the residential and commercial block groups results were aggregated to the MSA level. The same methodology was used to determine the residential and commercial paint expenditure in 350 MSA metropolitan areas across the United States.

Once the demographic analysis was completed the next task was to determine how many paint stores there were in the United States, their respective locations and estimated sales turnovers.

The locating and the tallying of the number of paint stores was a simple process. The estimating the store turnover required a series of procedures that would take the information gained from the residential and commercial demographic analysis and apply it to each respective paint outlet in the United States.

Those procedures included:

- Geocoding all paint stores in the United States.
- Do a drive time analysis on the paint stores using 5, 10, 15 and 20 minute timeframes.
- Geocoding all paint contractors in the United States.
- Do a drive time analysis on the painting contractors using 5, 10, 15 and 20 minute timeframes.

Geocoding is the process of converting addresses (like a street address) into geographic coordinates (like latitude and longitude), which you can use to place markers on a map, or position the map. (Fig. 6).

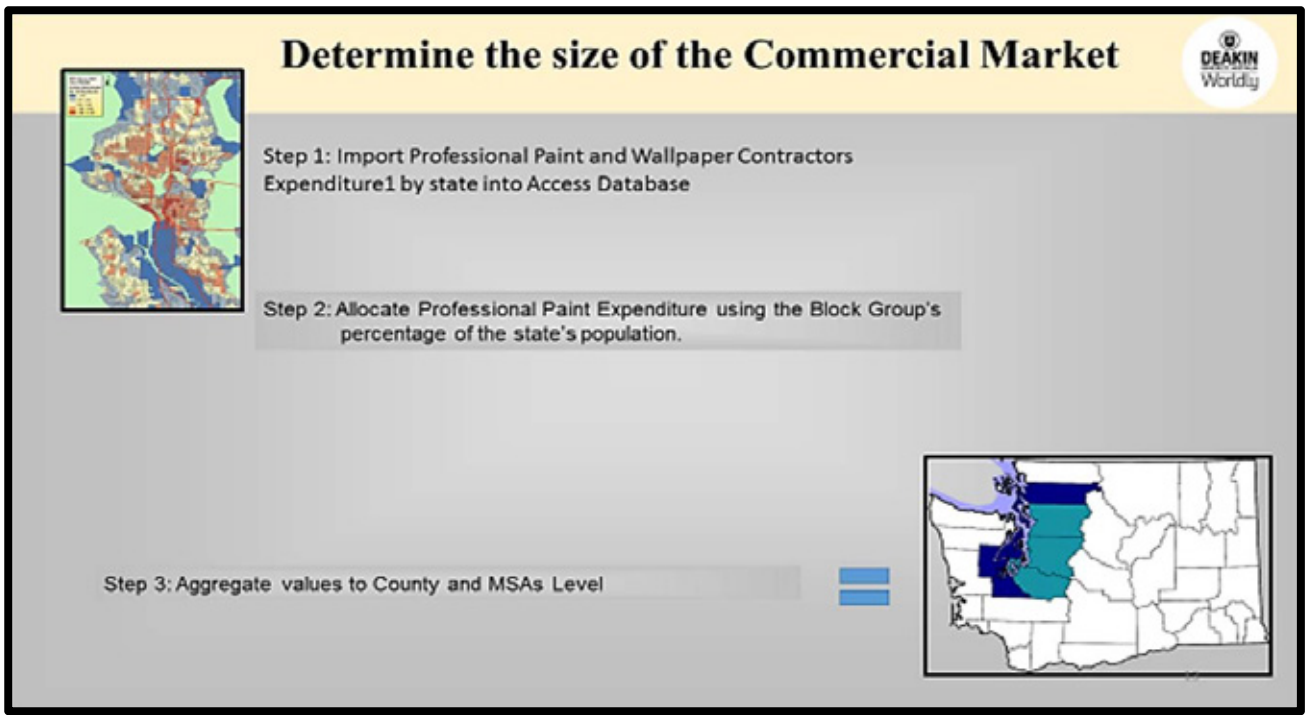


Fig. 5. Commercial/industrial Demographic Paint Analysis

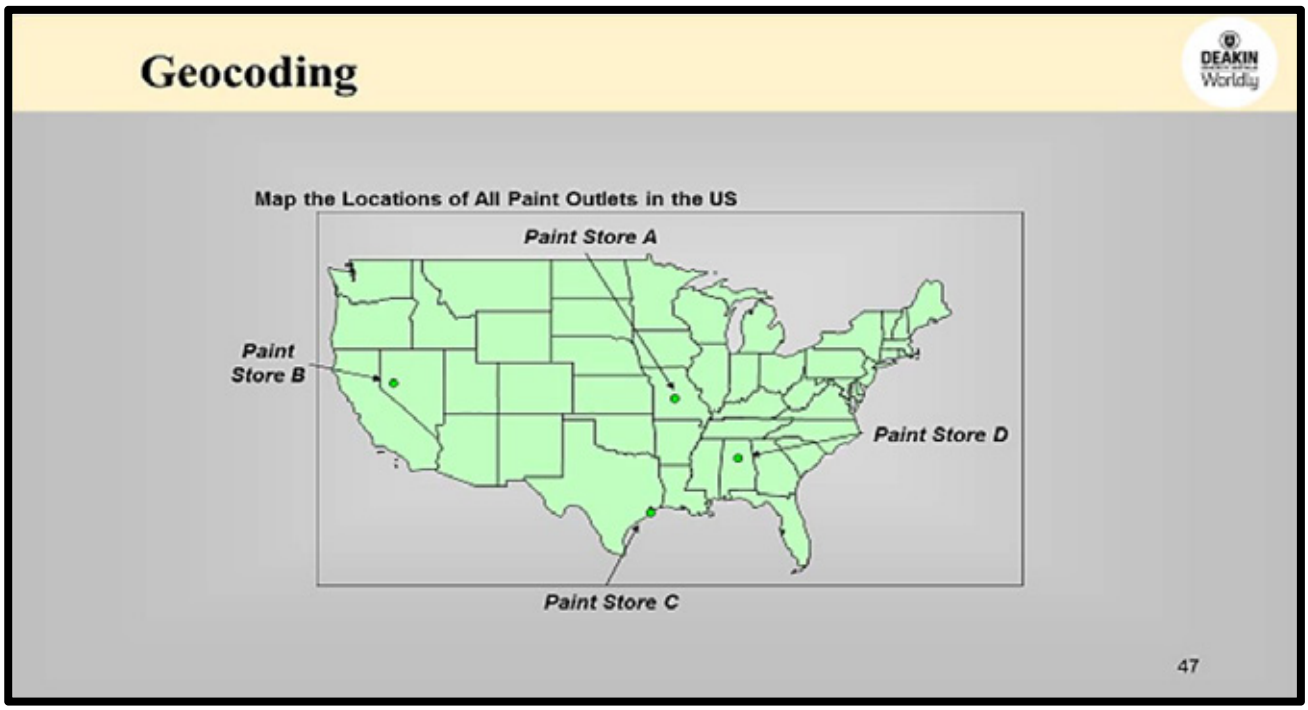


Fig. 6. Geocoding All Paint Stores

Once the geocoding process was completed the United States was classified in 27 Market classes using demographic analysis. ICI store profit and market share percentage was also calculated at this point.

The next step was to calculate the Net Present Value (NPV) for the paint sales in each of the ICI paint stores as shown in Fig. 7.

The final product was an MSA market ranking which ranked all 350 markets as to residential and commercial/industrial estimated sales values as shown in Fig. 6. The ranking also included the NPV value for each ICI Store and for the 350 MSA markets.

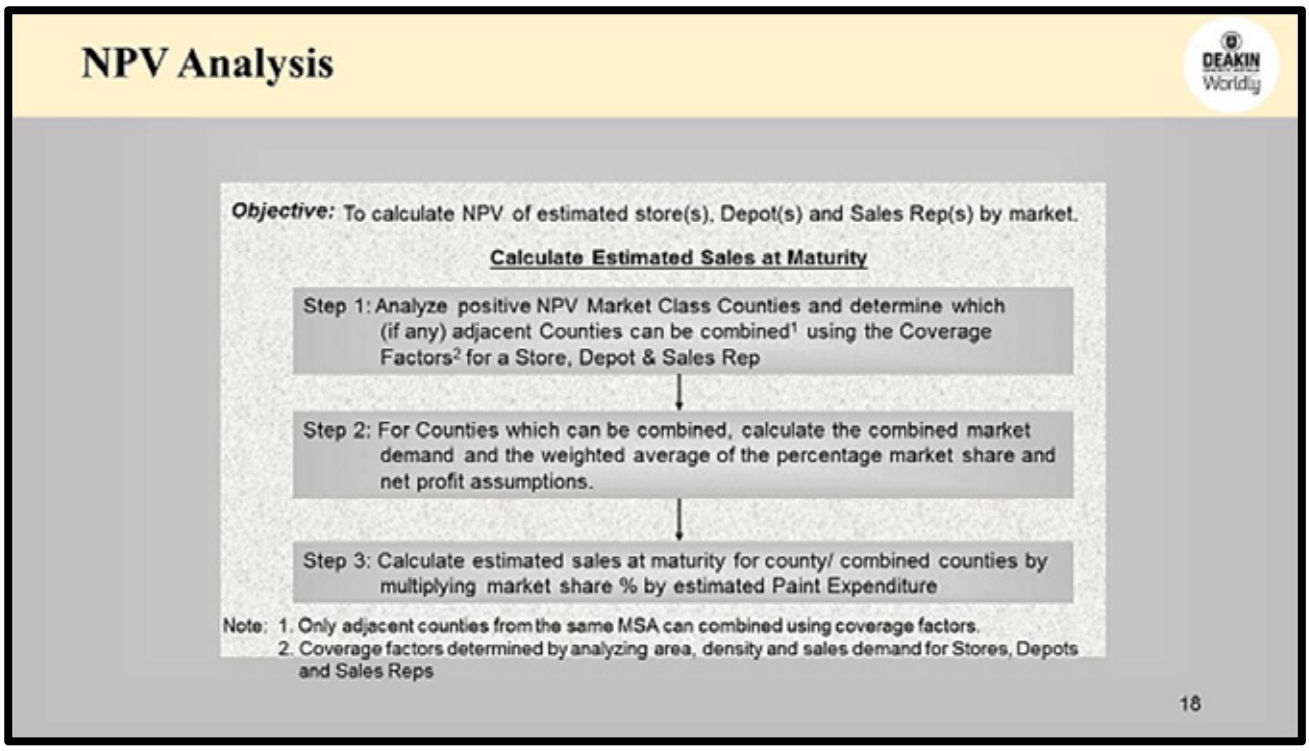
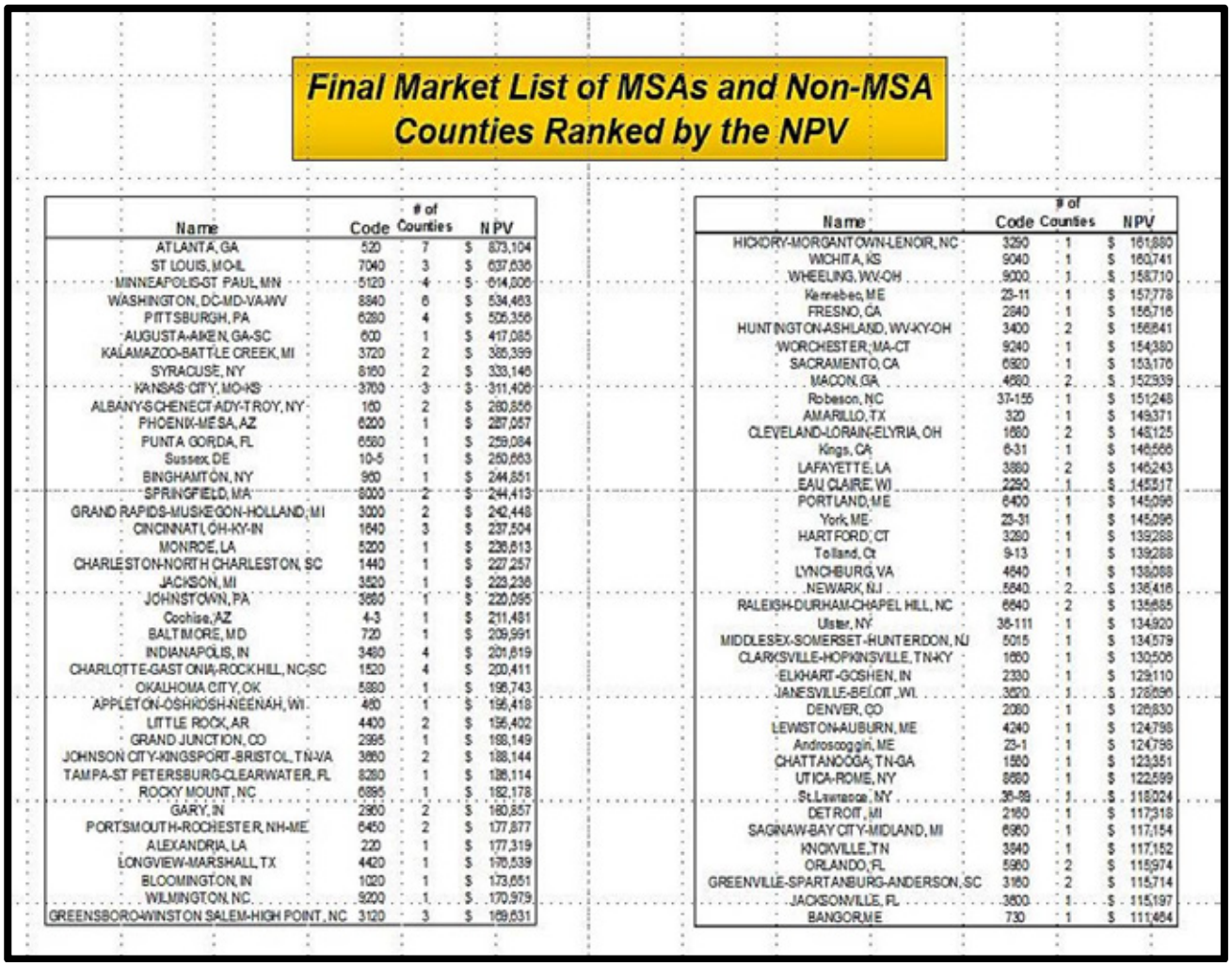


Fig. 7. NPV Value for Paint Stores



Name	Code	# of Counties	NPV
ATLANTA, GA	520	7	$ 873,104
ST LOUIS, MO-IL	7040	3	$ 637,636
MINNEAPOLIS-ST PAUL, MN	5120	4	$ 614,006
WASHINGTON, DC-MD-VA-WV	8840	6	$ 534,463
PITTSBURGH, PA	6280	4	$ 505,356
AUGUSTA-AIKEN, GA-SC	600	1	$ 417,085
KALAMAZOO-BATTLE CREEK, MI	3720	2	$ 385,399
SYRACUSE, NY	8160	2	$ 333,146
KANSAS CITY, MO-KS	3760	3	$ 311,406
ALBANY-SCHENECTADY-TROY, NY	160	2	$ 260,856
PHOENIX-MESA, AZ	6200	1	$ 257,057
PUNTA GORDA, FL	6560	1	$ 256,084
Sussex, DE	10-5	1	$ 250,663
BINGHAMTON, NY	960	1	$ 244,851
SPRINGFIELD, MA	8000	2	$ 244,413
GRAND RAPIDS-MUSKEGON-HOLLAND, MI	3000	2	$ 242,448
CINCINNATI, OH-KY-IN	1640	3	$ 237,504
MONROE, LA	5200	1	$ 236,613
CHARLESTON-NORTH CHARLESTON, SC	1440	1	$ 227,257
JACKSON, MI	3520	1	$ 223,236
JOHNSTOWN, PA	3660	1	$ 220,095
Cochise, AZ	4-3	1	$ 211,481
BALTIMORE, MD	720	1	$ 209,991
INDIANAPOLIS, IN	3480	4	$ 201,819
CHARLOTTE-GASTONIA-ROCK HILL, NC-SC	1520	4	$ 200,411
OKLAHOMA CITY, OK	5880	1	$ 195,743
APPLETON-OSHKOSH-NEENAH, WI	480	1	$ 195,418
LITTLE ROCK, AR	4400	2	$ 195,402
GRAND JUNCTION, CO	2995	1	$ 188,149
JOHNSON CITY-KINGSPORT-BRISTOL, TN-VA	3660	2	$ 188,144
TAMPA-ST PETERSBURG-CLEARWATER, FL	8280	1	$ 186,114
ROCKY MOUNT, NC	6895	1	$ 182,178
GARY, IN	2960	2	$ 180,857
PORTSMOUTH-ROCHESTER, NH-ME	6450	2	$ 177,877
ALEXANDRIA, LA	220	1	$ 177,319
LONGVIEW-MARSHALL, TX	4420	1	$ 176,539
BLOOMINGTON, IN	1020	1	$ 173,651
WILMINGTON, NC	9200	1	$ 170,979
GREENSBORO-WINSTON SALEM-HIGH POINT, NC	3120	3	$ 169,631

Name	Code	# of Counties	NPV
HICKORY-MORGANTOWN-LENOIR, NC	3290	1	$ 161,880
WICHITA, KS	9040	1	$ 160,741
WHEELING, WV-OH	9000	1	$ 158,710
Kennebec, ME	23-11	1	$ 157,778
FRESNO, CA	2840	1	$ 156,716
HUNTINGTON-ASHLAND, WV-KY-OH	3400	2	$ 156,641
WORCHESTER, MA-CT	9240	1	$ 154,380
SACRAMENTO, CA	6920	1	$ 153,176
MACON, GA	4680	2	$ 152,939
Robeson, NC	37-155	1	$ 151,248
AMARILLO, TX	320	1	$ 149,371
CLEVELAND-LORAIN-ELYRIA, OH	1680	2	$ 148,125
Kings, CA	6-31	1	$ 146,566
LAFAYETTE, LA	3880	2	$ 146,243
EAU CLAIRE, WI	2250	1	$ 145,517
PORTLAND, ME	6400	1	$ 145,096
York, ME	23-31	1	$ 145,096
HARTFORD, CT	3280	1	$ 139,288
Tolland, Ct	9-13	1	$ 139,288
LYNCHBURG, VA	4640	1	$ 138,088
NEWARK, NJ	5640	2	$ 136,416
RALEIGH-DURHAM-CHAPEL HILL, NC	6640	2	$ 135,685
Ulster, NY	36-111	1	$ 134,920
MIDDLESEX-SOMERSET-HUNTERDON, NJ	5015	1	$ 134,579
CLARKSVILLE-HOPKINSVILLE, TN-KY	1600	1	$ 130,506
ELKHART-GOSHEN, IN	2330	1	$ 129,110
JANESVILLE-BELOIT, WI	3920	1	$ 126,696
DENVER, CO	2080	1	$ 126,830
LEWISTON-AUBURN, ME	4240	1	$ 124,798
Androscoggin, ME	23-1	1	$ 124,798
CHATTANOOGA, TN-GA	1560	1	$ 123,351
UTICA-ROME, NY	8560	1	$ 122,599
St.Lawrence, NY	36-89	1	$ 118,024
DETROIT, MI	2160	1	$ 117,318
SAGINAW-BAY CITY-MIDLAND, MI	6960	1	$ 117,154
KNOXVILLE, TN	3840	1	$ 117,152
ORLANDO, FL	5960	2	$ 115,974
GREENVILLE-SPARTANBURG-ANDERSON, SC	3160	2	$ 115,714
JACKSONVILLE, FL	3600	1	$ 115,197
BANGOR, ME	730	1	$ 111,464

Fig. 8. Final Market ranking

Results for Task 1

The US paint market was estimated to a have a value in excess of $3 billion per annum with ICI Paints having a 24% to 26% market share.

Task 2 Location (Painters, Paint Job Areas, ICI Stores, Competition Stores)

The second task involved:

1. Drive times analysis for each Block group in the United States (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins).
2. Identify and Analyse Professional Painters across the United States.
3. Develop Professional Painters Database.
4. Drive time Analysis of professional painters (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins).
5. Identify and map all paint job areas by block area group across Metropolitan paint markets.
6. Drive time Analysis of current ICI stores (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins).

The purpose of Step 2 is to quantify the dollar value catchment area of each ICI paint store location. Each of the components in Step 2 was done in sequential order to determine whether or not the existing ICI stores were in the right location and whether they were at their optimum financial performance and viability.

The Catchment area process included a series of drive times analysis for each block group and each store. The process is shown in Fig. 9.

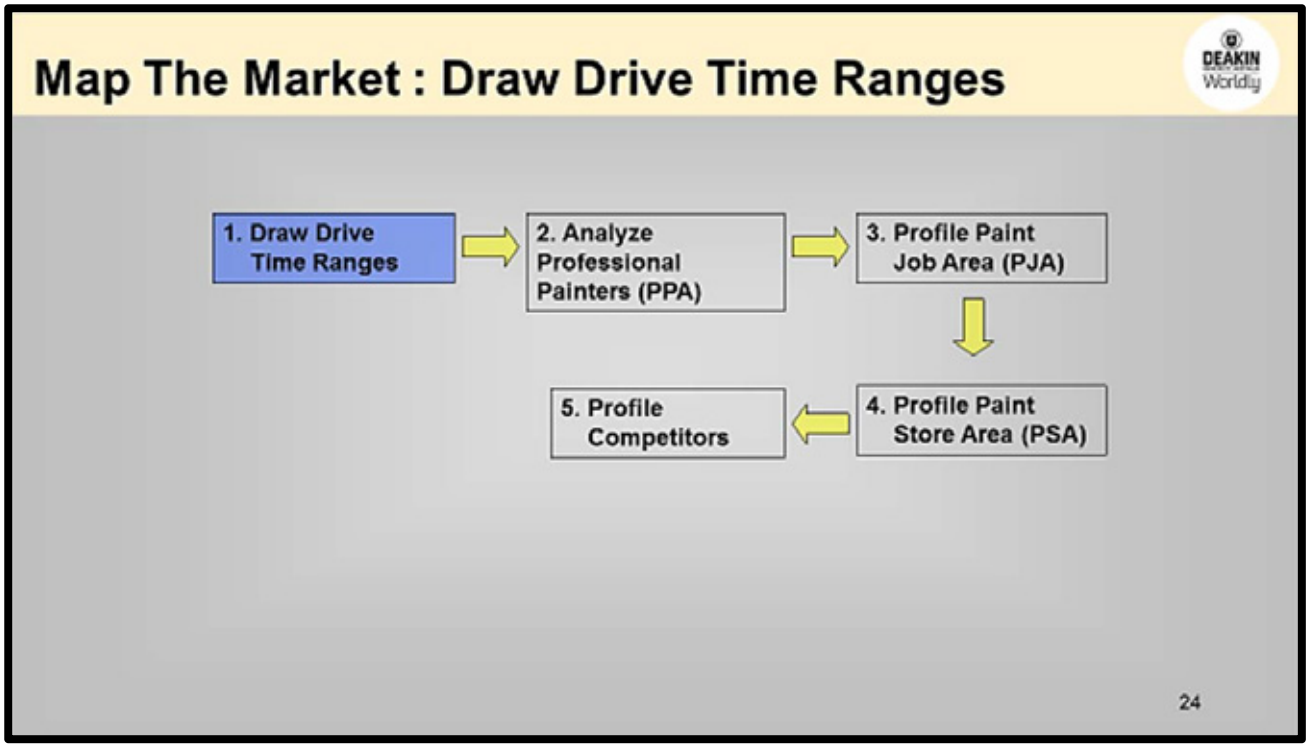


Fig. 9. Draw Drive Times

A series of drive times (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins) for block group were the first to be drawn (Fig. 10).

The reason for doing a drive time analysis for each block group in the 350 MSA market assisted:

- Analysing the existing store(s) profitability.
- Performed a breakeven analysis for store opening and store relocation.
- Determined whether ICI existing store(s) should be kept relocated or closed based on their financial performance.

- Identified existing store(s) market coverage, network gaps and potential new sites.

An example of the block group drive time analysis is shown in Fig. 11.

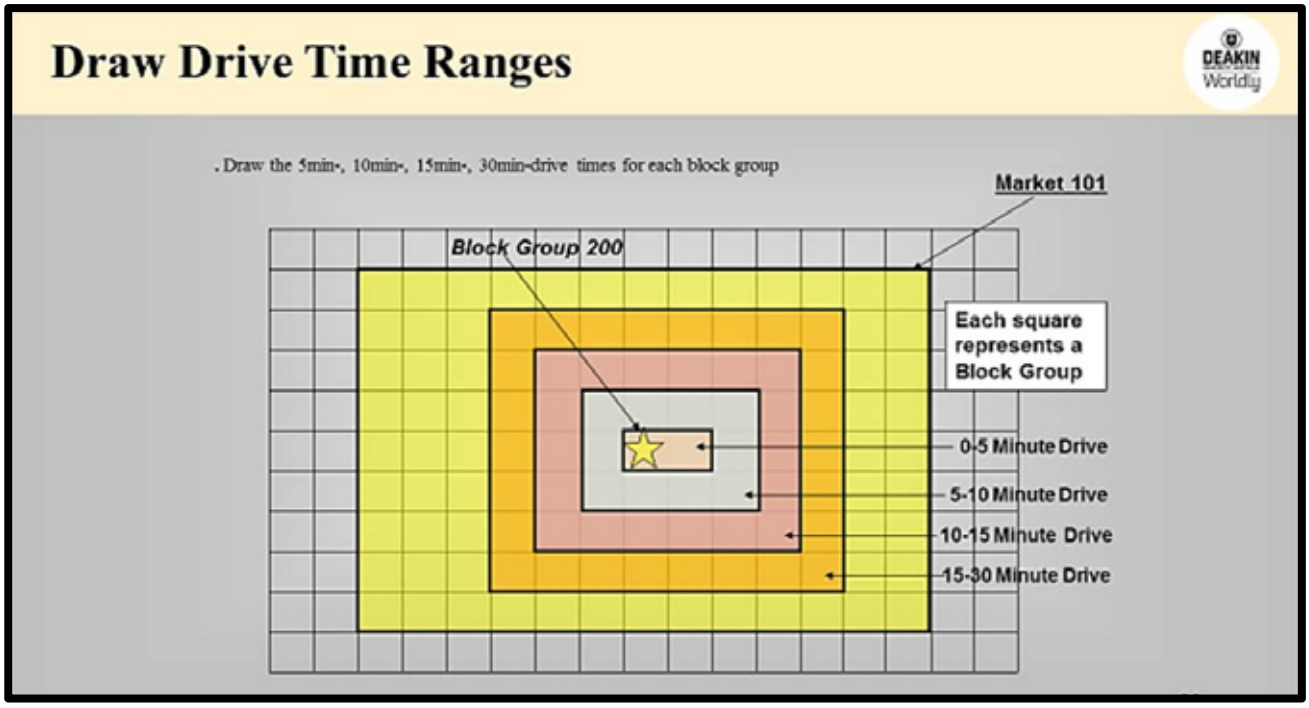


Fig. 10. Block Group Drive Time Ranges

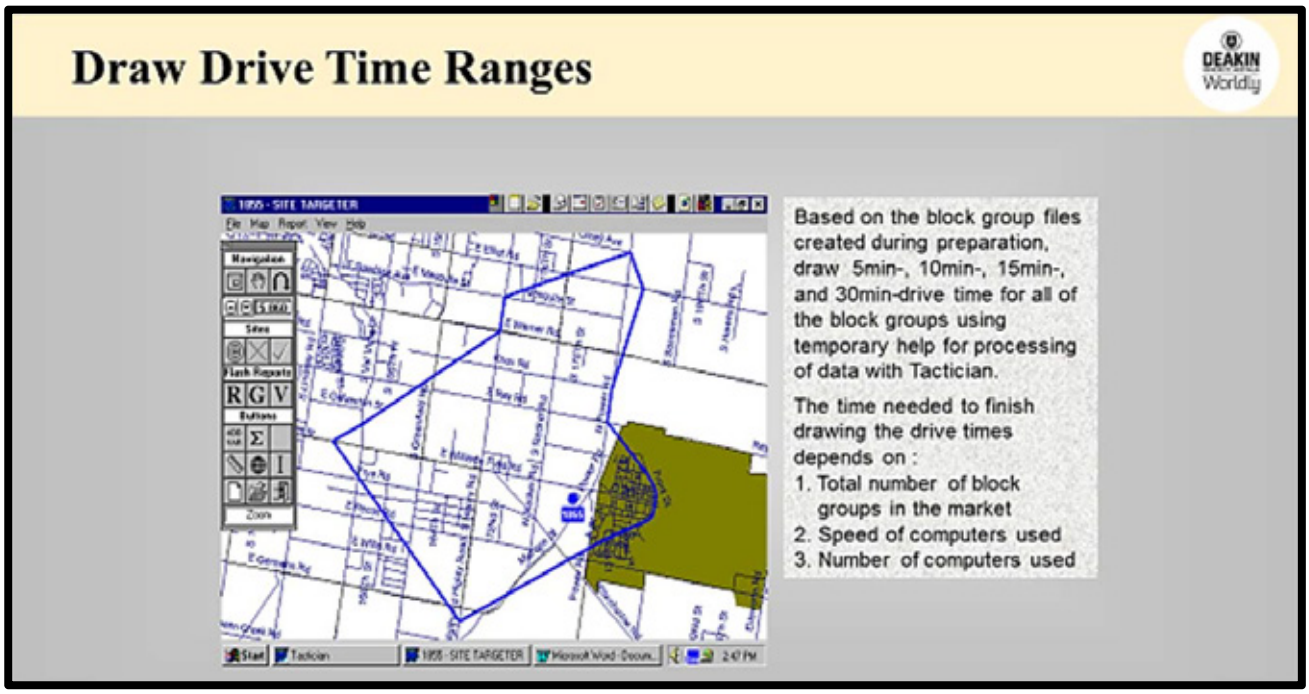


Fig. 11. Block Group Drive Time

Step 2 was to identify quantify and analyse the number of painters per MSA area in the United States. All professional painter information was incorporated into a database that contained the following information (Fig. 12).

A drive time analysis of all professional painters was undertaken to determine the maximum coverage area. This process along with painter surveys and extrapolated sales data allowed the painters to be ranked as to yearly turnover as shown in Fig. 13.

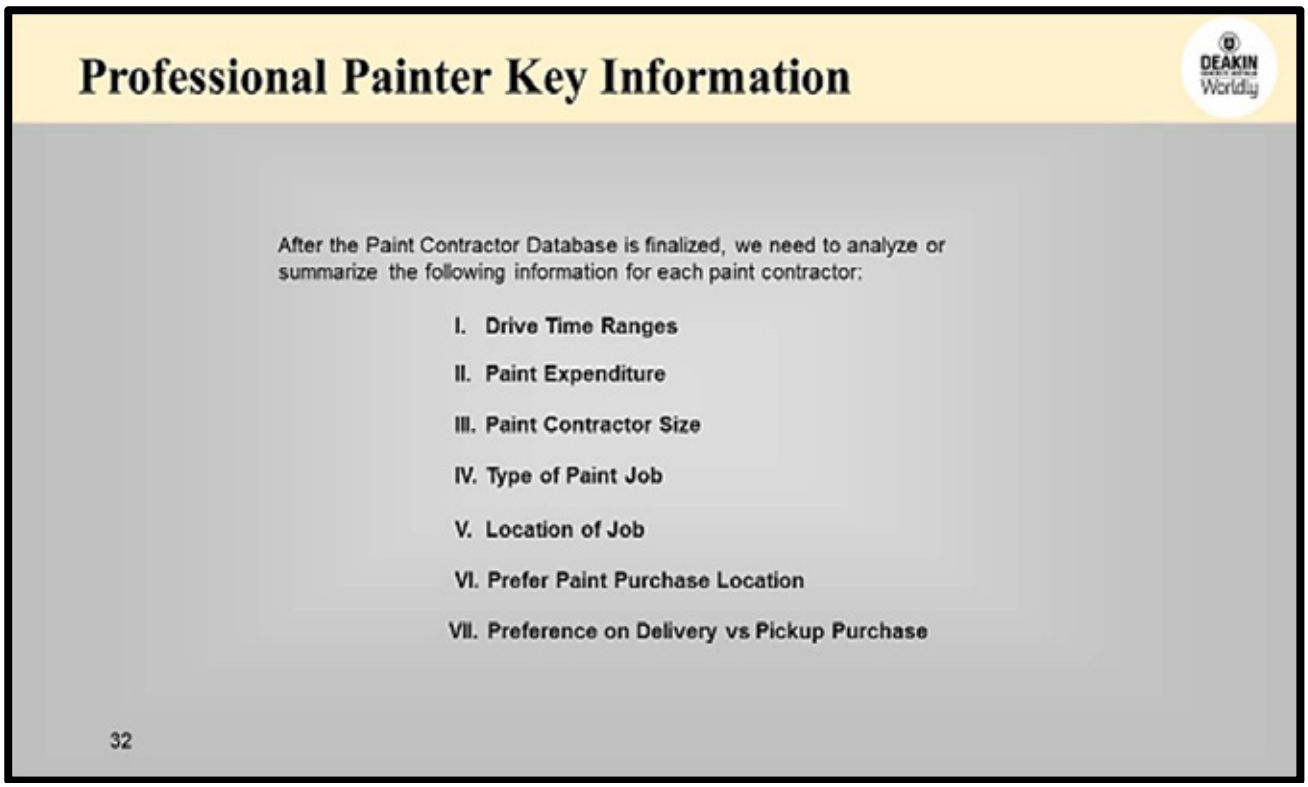


Fig. 12. Information in the Professional Painter Database

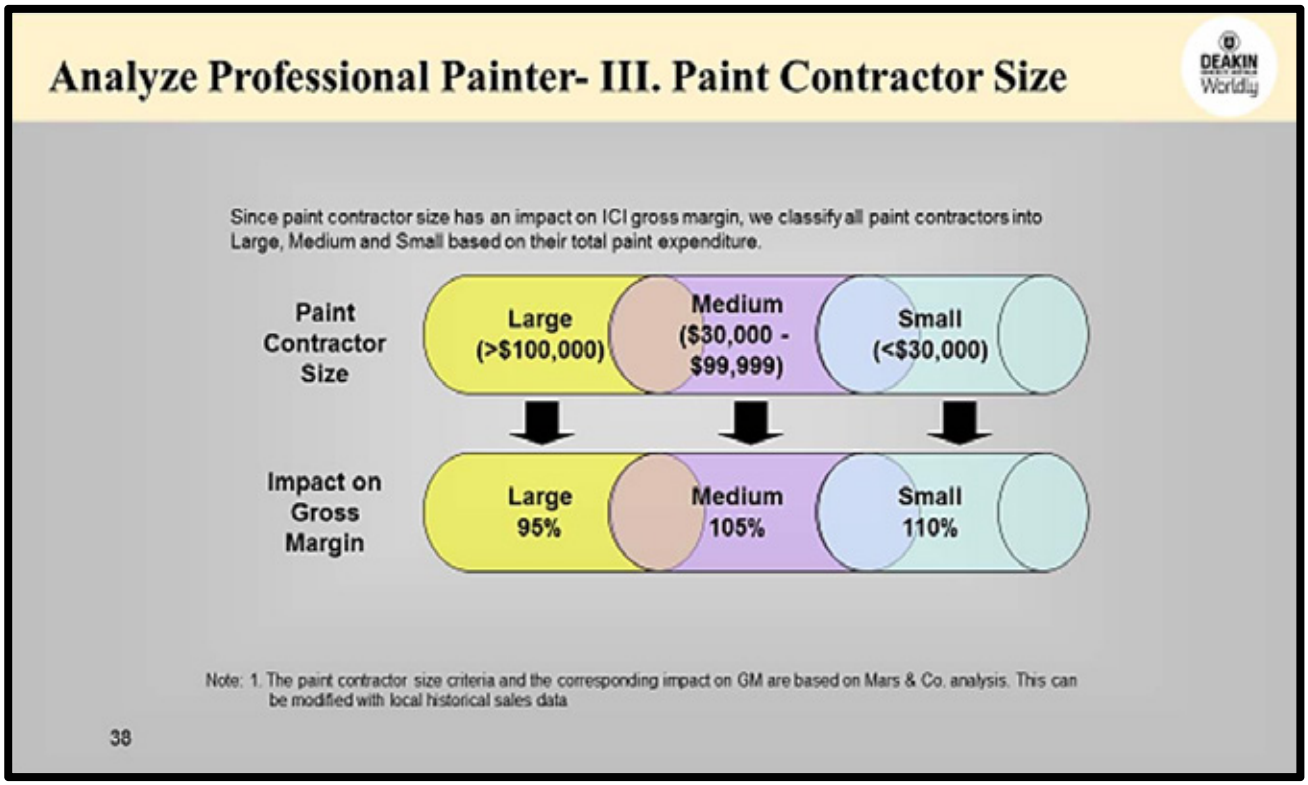


Fig. 13. Paint contractor size

All information gathered on professional painters was contained in a Painter Coverage Model as shown in Fig. 14.

Step 3 was the profiling the MSA paint area. This step involved quantifying the various zoning and building types per block group.

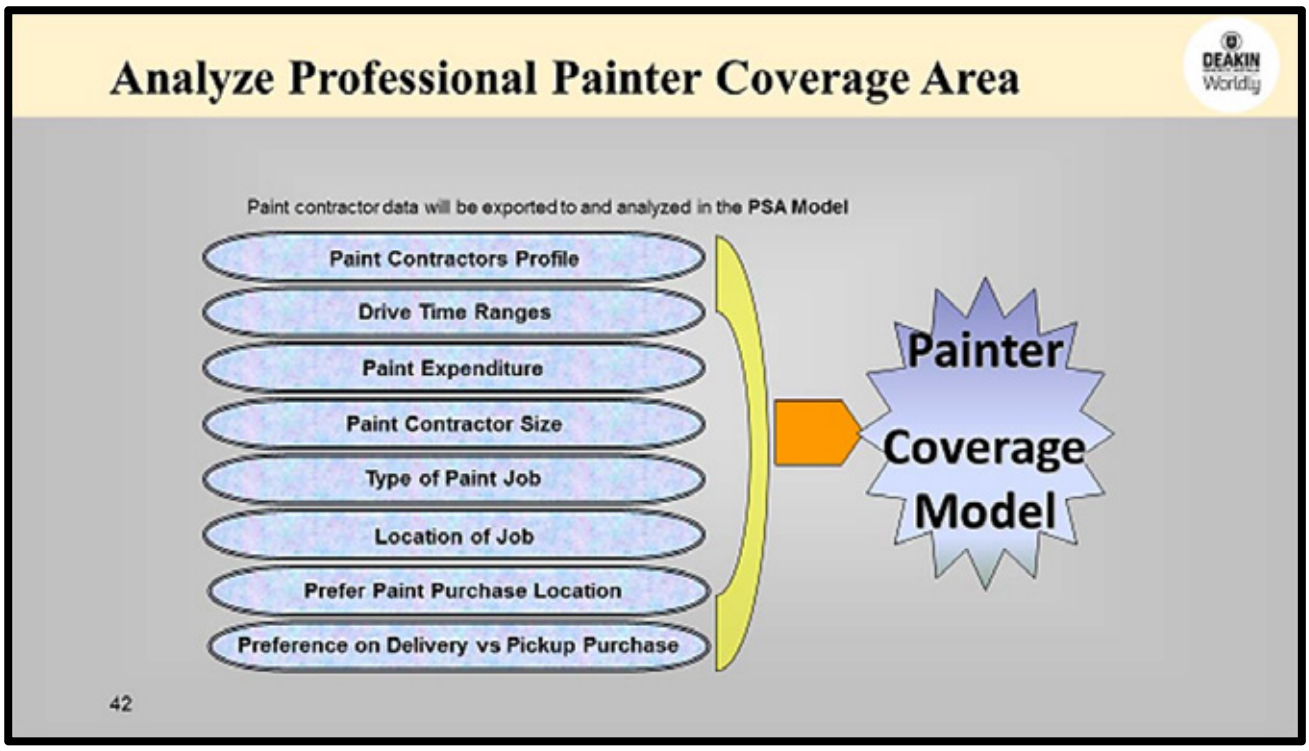


Fig. 14. Professional Painter Coverage Model

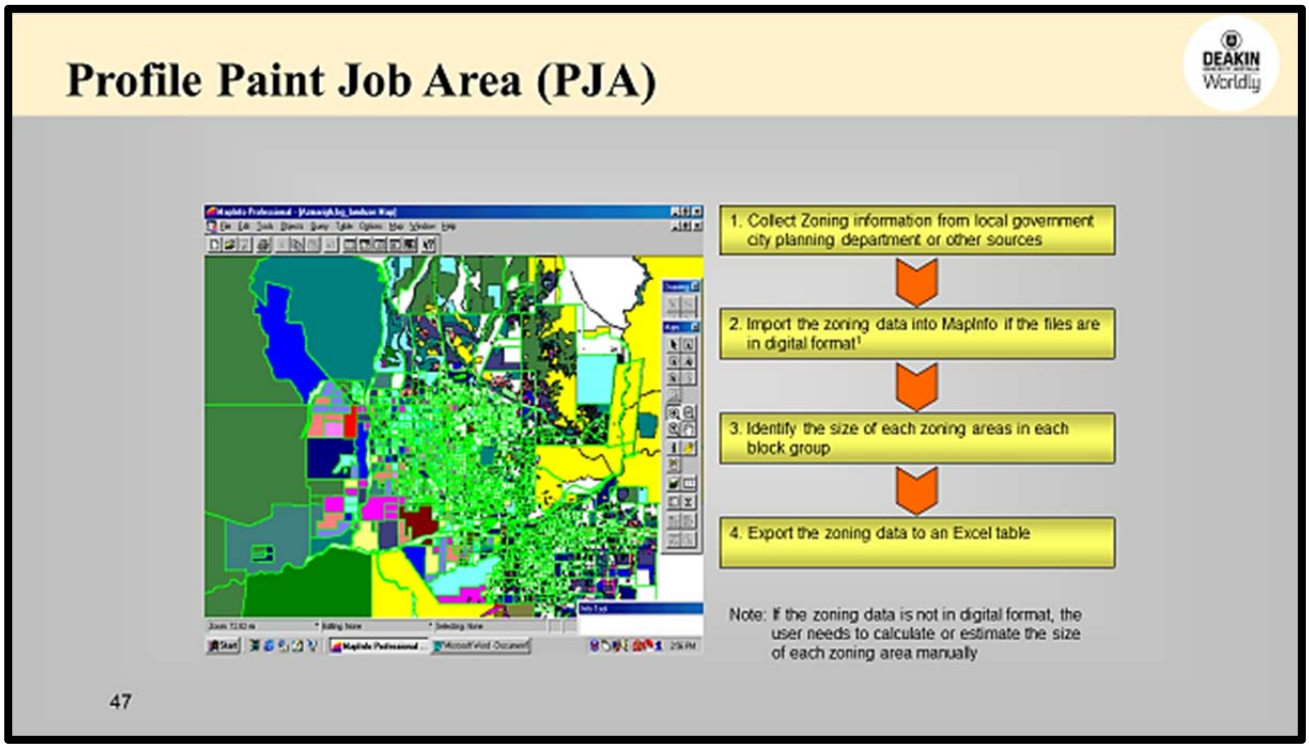


Fig. 15. Profiling the Various Paint areas

The data that was obtained through this process is shown in Fig. 16. As illustrated in Fig. 16 the type of sales segment (i.e. residential, commercial or industrial) was segmented by the various zoning types.

Fig. 17 shows an allocation table indicating the potential commercial paint job area (i.e. the potential total area that could be painted per block group). The information in Fig. 17 directly influences the profitability calculations for each existing paint store.

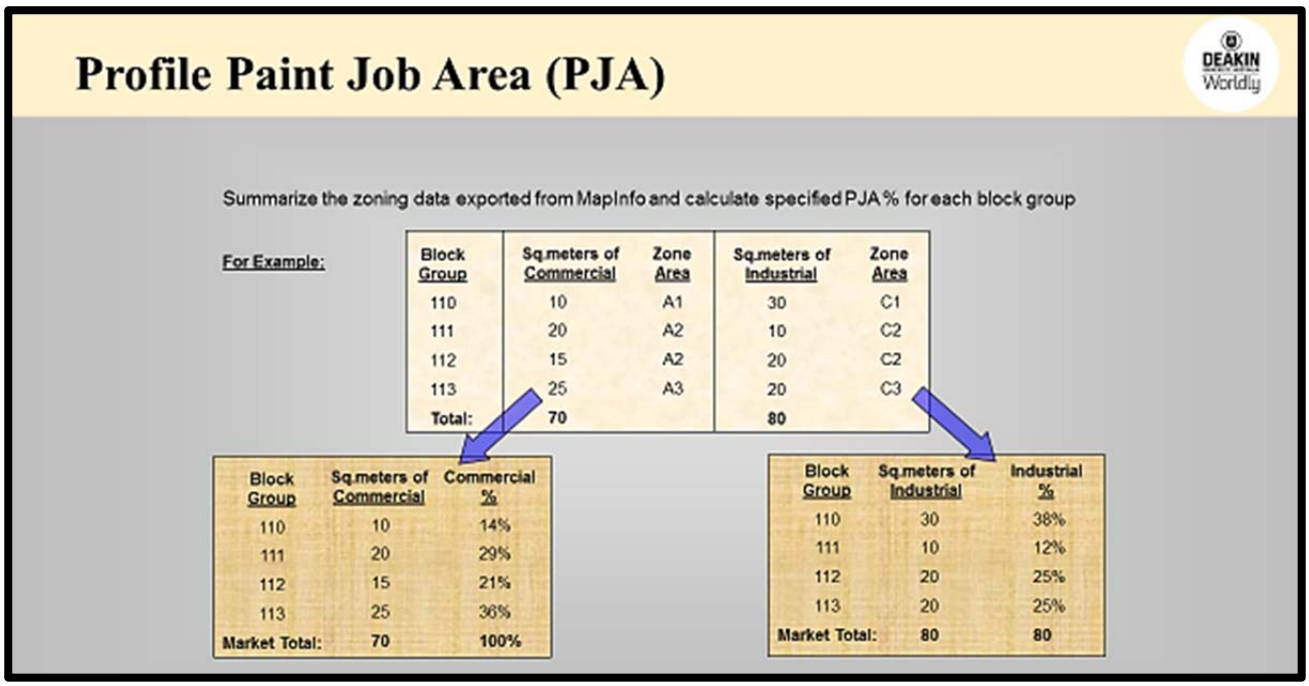


Fig. 16. Summarized zoning data

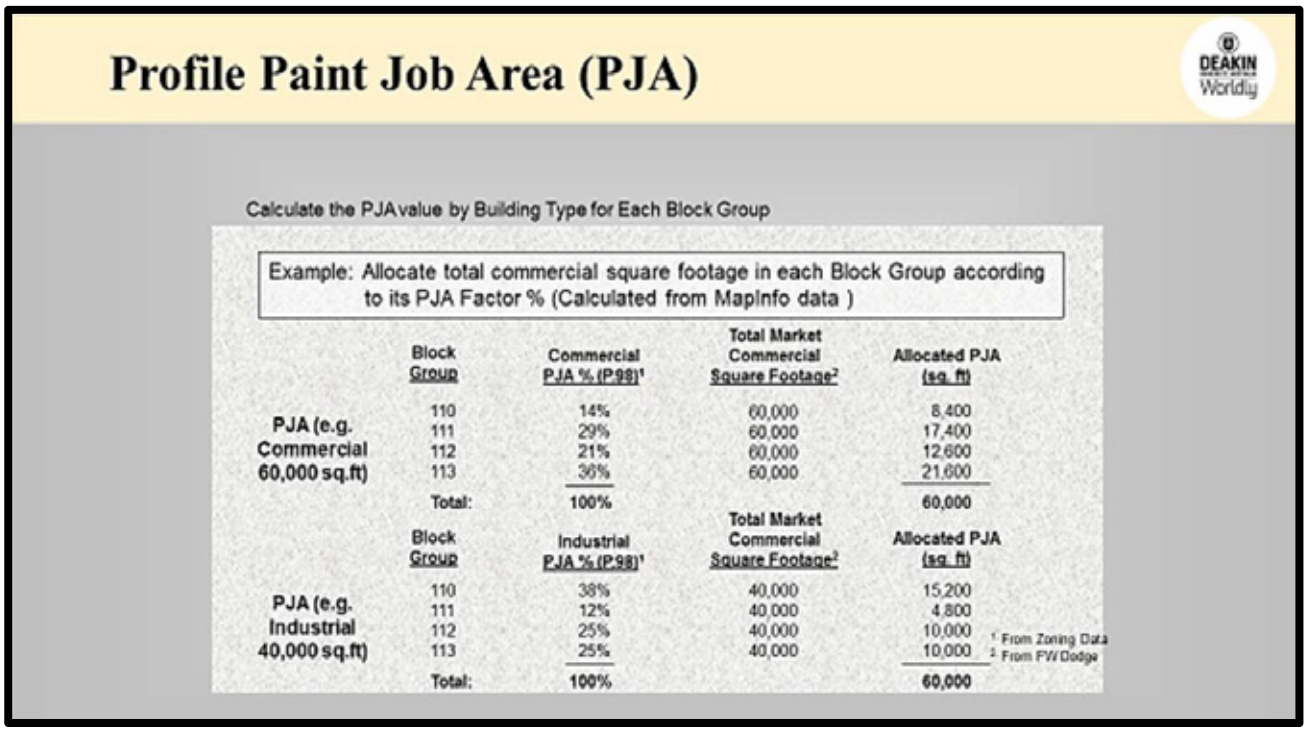


Fig. 17. Building type per Block Group

The results from Fig. 17 influenced or guided the question ***are my current stores in the right or optimal sales location or is there a better location for each ICI store?*** This decision is based on what type of paint market currently exists in each respective store area.

Step 4 shows how each existing paint store will have its own unique store profile. The store profile is comprised of retail and commercial sales. Fig. 18 shows how a store profile is comprised of residential, commercial and industrial sales components.

The residential component is further broken down into single or multi residential dwellings while the commercial component is broken down into public and regular commercial sectors.

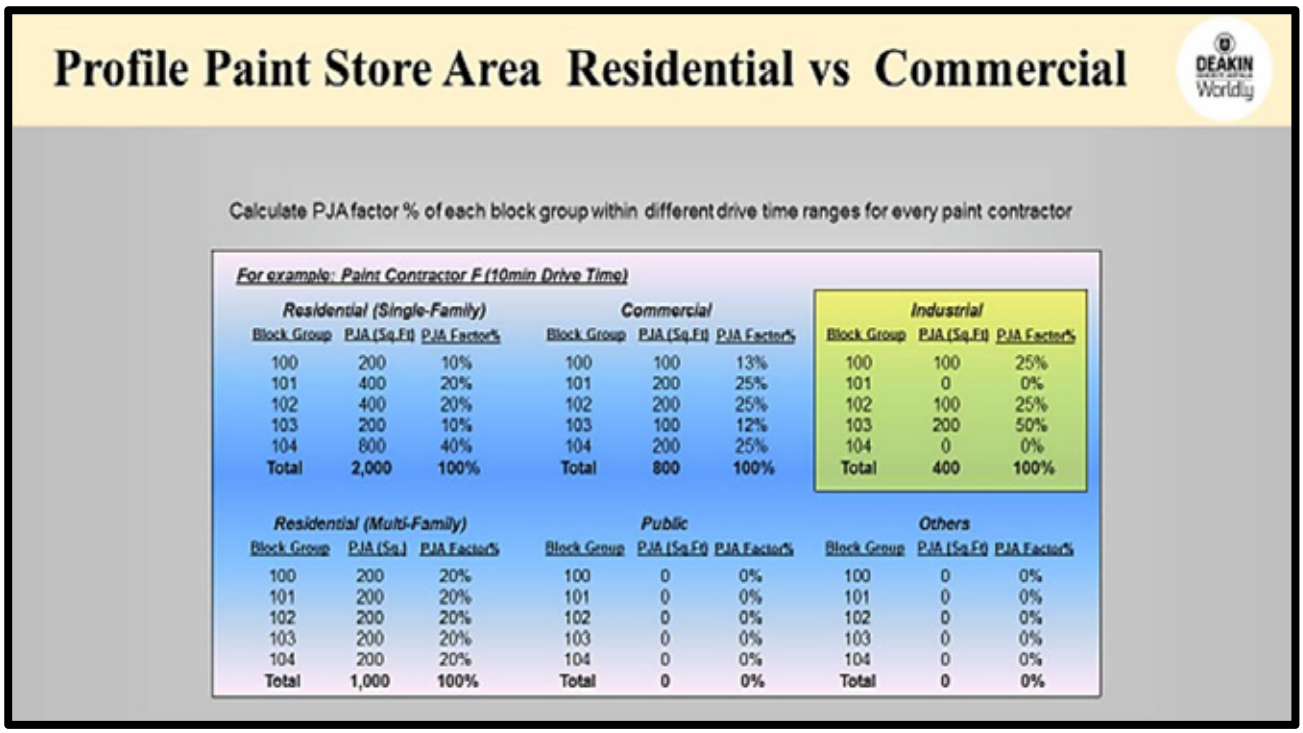


Fig. 18. Residential vs Commercial components

The retail sales component is similar in all stores with the differences occurring in the commercial and industrial components. Fig. 19 highlights the two components of the professional painter commercial and industrial market, delivery sales and pickup sales.

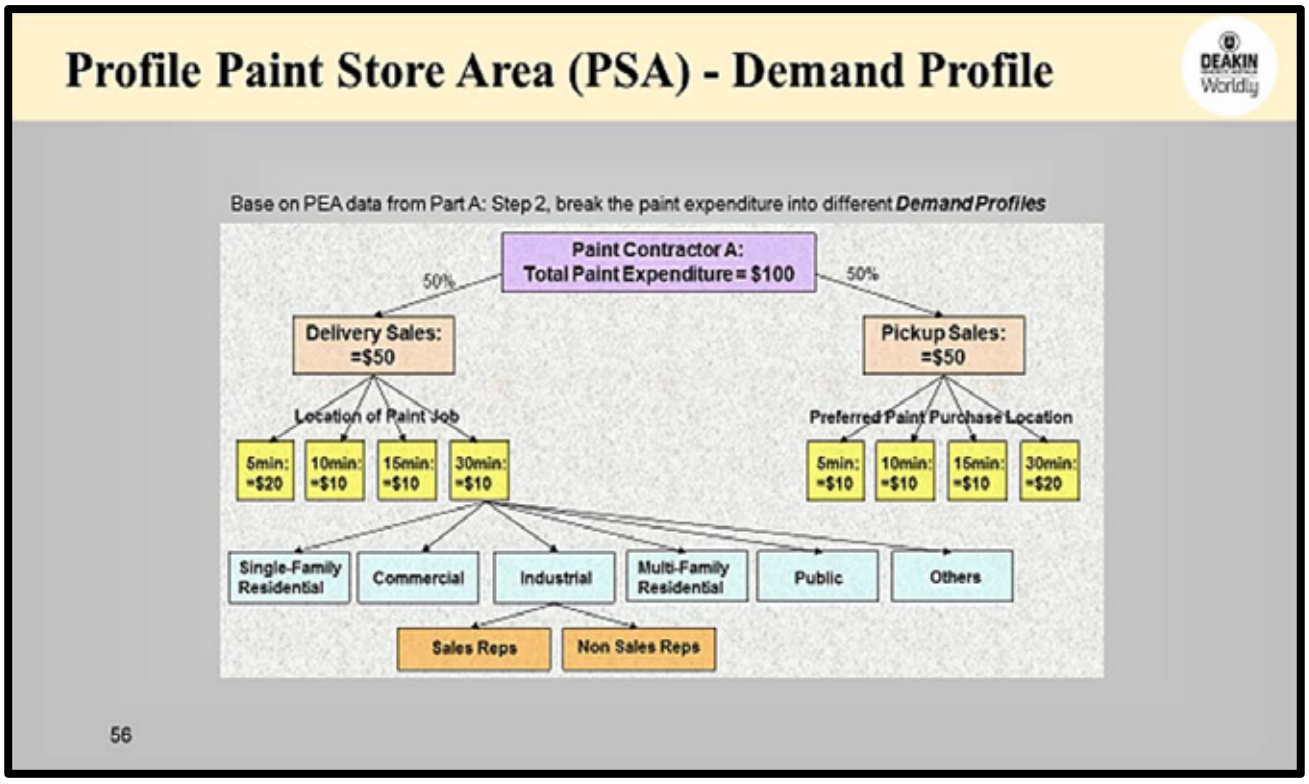


Fig. 19. Commercial and Industrial Sales Profiles

Step 5 is profiling all other paint stores in the 350 MSA's. The process for the task is the same as was used to profile existing ICI stores.

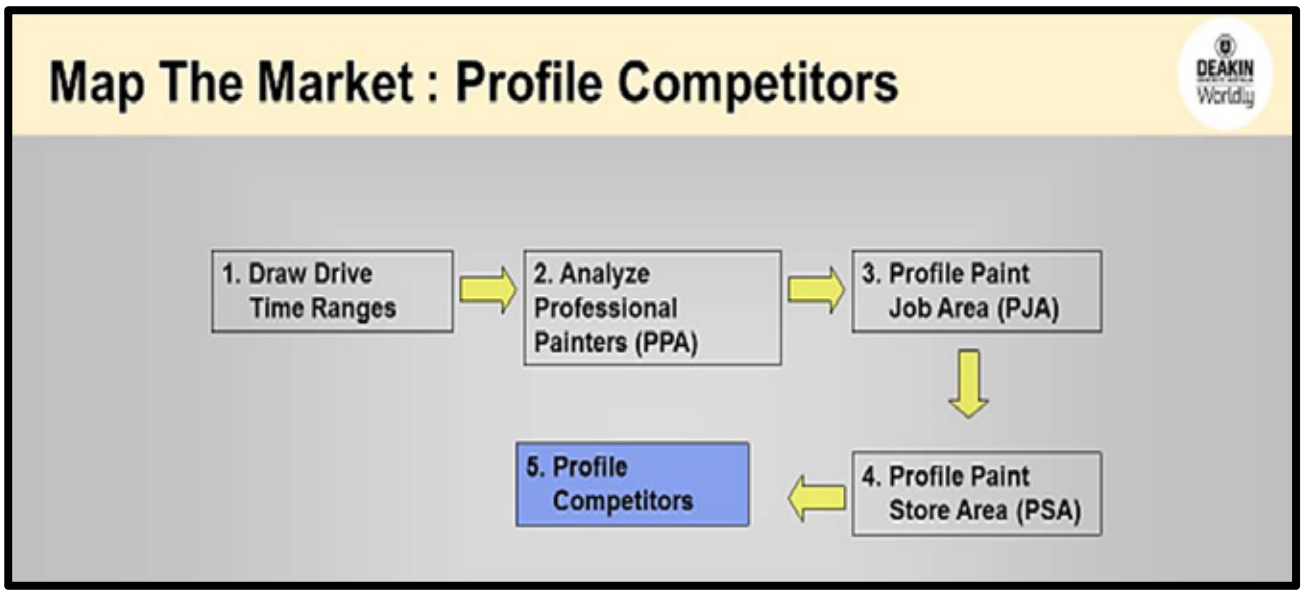


Fig. 20. Profiling Competitors

The process included:

- Identify the location, block group and brand association of each store in each MSA;
- Geocode each store;
- Do a drive time analysis on each store (0–5 mins; 5–10 mins; 10–15 mins; 15–30 mins);
- Number of Painters in the competitors area;
- Type of paint jobs in the competitors area; and
- Preference as to Delivery vs Pickup purchases.

Results for Task 2 Location

The results for Step 2 identified every paint store, professional painter and estimated total paint volumes by type of building for 350 MSA areas.

Task 3 Optimal store Location

Task 3 objective is:

- To identify the ideal location(s) for paint store(s); and
- To estimate the impact of the ideal network on ICI's performance in the market.

Step 3 is comprised of 7 steps as shown in Fig. 21. The Competition Analysis is based on existing paint retail outlets' market share, level of competition, drive time ranges, drive time factors, delivery versus pickup sales and PSA value of block groups, estimate the amount of PSA value that each existing paint retail outlet would capture under the competition model.

Task 3 the optimal store location combines the work of Task 1 and Task 2.

Step 1 is to use the geocoded, mapped and drive time data for each paint store in every MSA area.

The next process in Step1 is to determine the volume of Delivery versus Pickup sales volume. Delivery sales refers to products shipped out from the store to the customer site. As long as the store is somewhere within a reasonable distance (current assumption of 30min drive time) from the customer site it is assumed that the store can deliver the product on time. Therefore, the store location in relation to competitors does not matter as long as the site is within the drive time assumptions. Therefore, there is no drive time factor used for delivery sales.

For pickup sales, stores have competitive advantage over other stores if they are closer to the location where a painter prefers to purchase paint. Therefore, a drive time factor is applied to adjust the competitiveness of each store in relation to its drive time factor (e.g. 70% of market share on block groups that are within 10min drive time range of a store site).

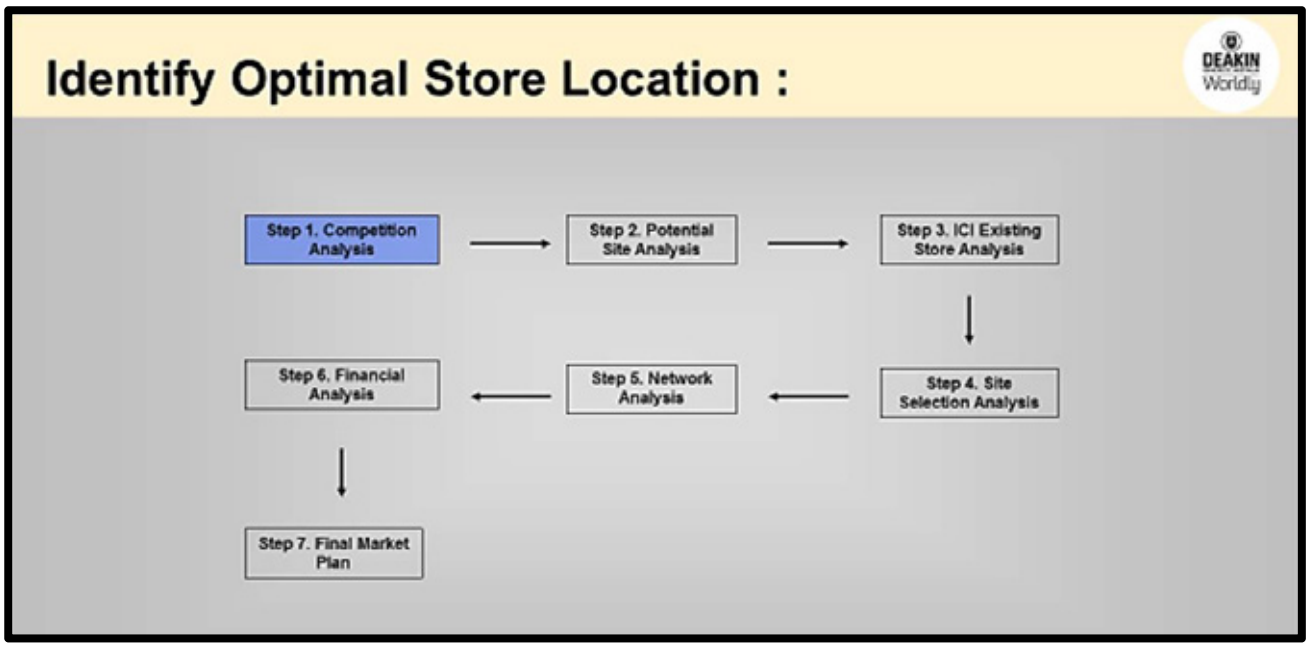


Fig. 21. Optimal Store Location

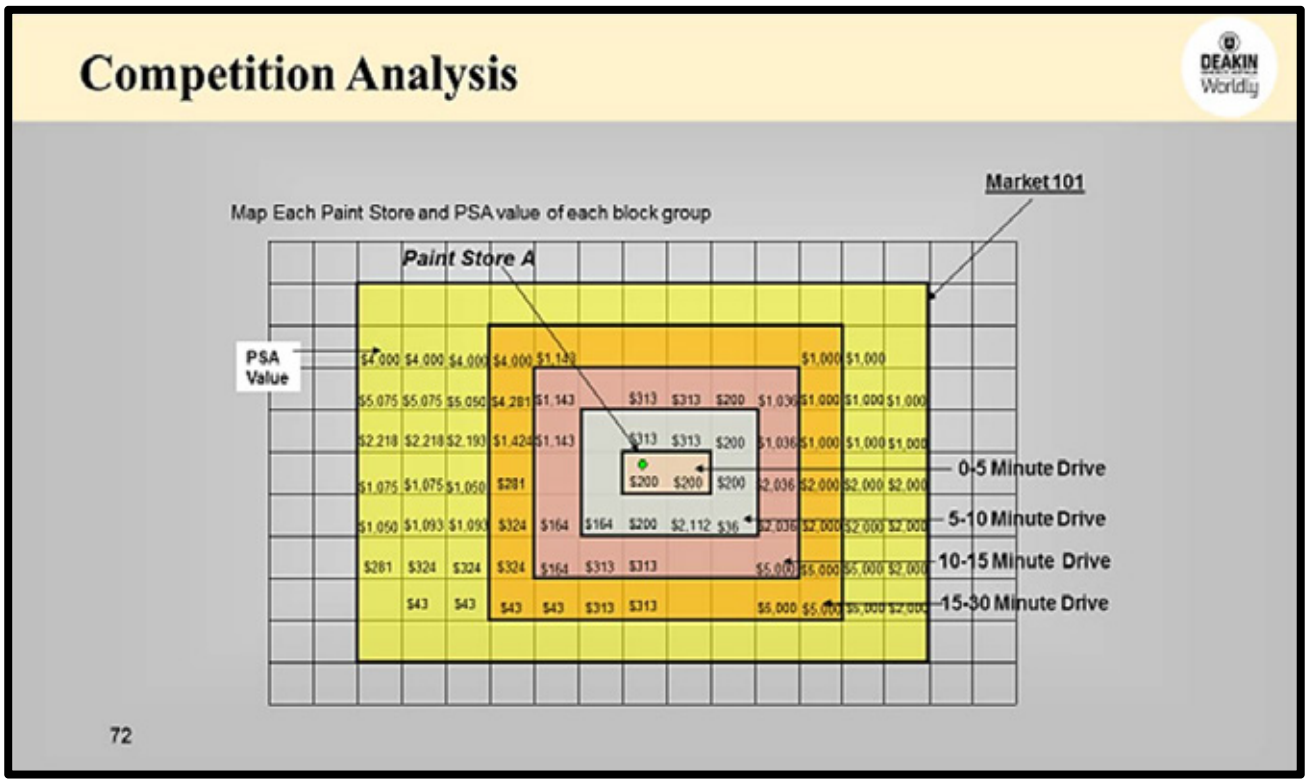


Fig. 22. Drive Time Analysis for all Competition Paint Stores

An example of the impact delivery versus pick up sales would have on an individual stores is shown in Fig. 23.

Step 2 involves potential site analysis where the objective is to calculate the estimated paint sales area value and the corresponding gross margin captured by each potential site. The potential site analysis required mapping all the potential paint stores.

Step 3 involves performing an analysis on existing ICI stores to analyze the existing store(s) profitability. The analysis would determine whether the existing ICI store(s) should be kept, relocated or closed based on their financial performance.

Step 4 involves the selection of the top potential sites and grouping them by location as shown in Fig. 24. The selection is based on area value and growth margin.

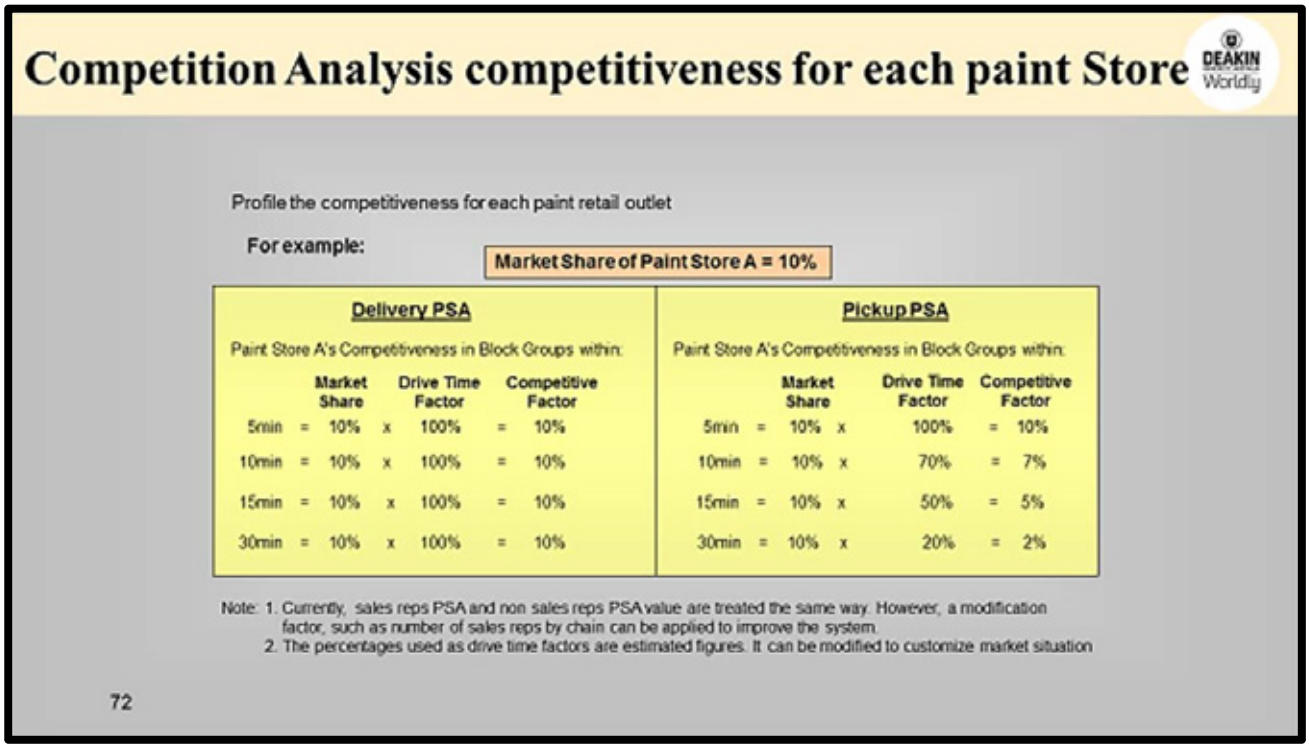


Fig. 23. Delivery vs Pick Sales Impact on Individual Stores

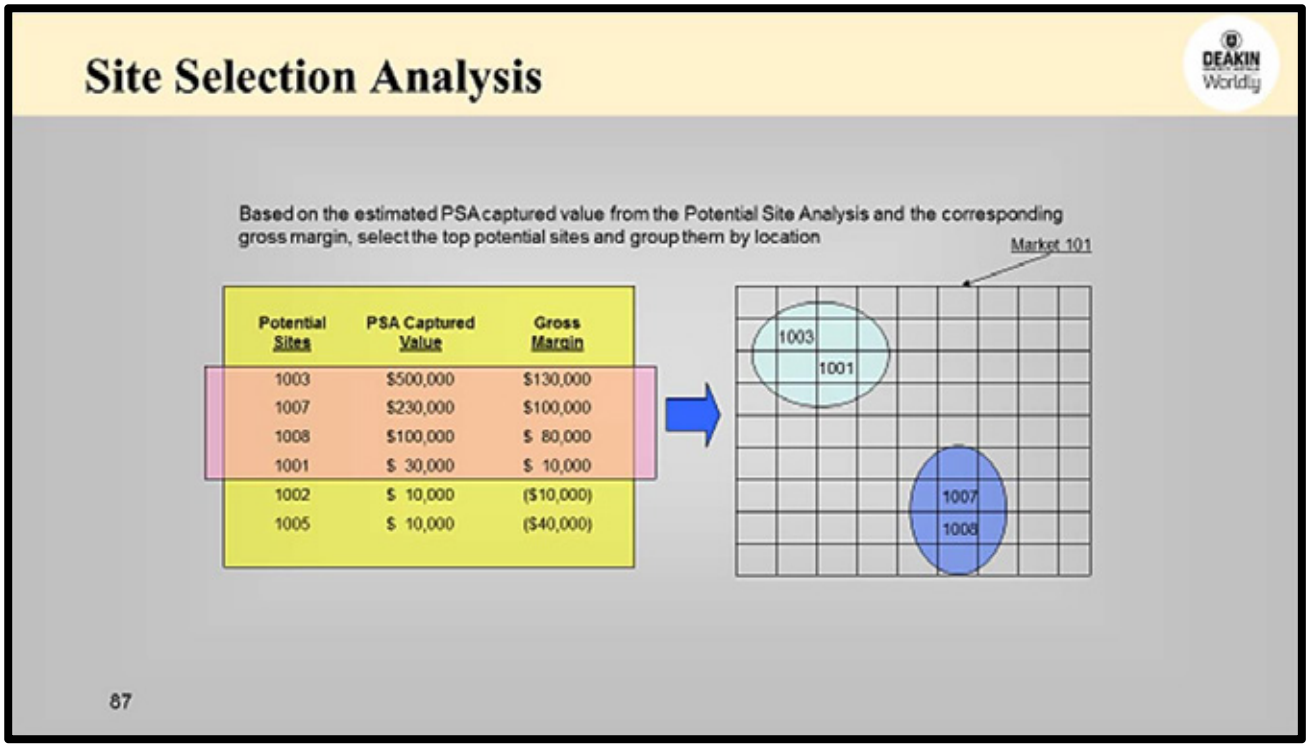


Fig. 24. Site Selection Analysis

Step 5 once the potential sites have been identifies the next step is to perform a network analysis to see what impacts any new stores would have on the existing stores. The criteria used in the network analysis includes:

- Maximizing the market coverage of the store(s).
- Maximize the total network profit and total net present value.
- Minimize the cost incurred for terminating the existing lease(s).
- Maximize capital investment available to open or relocate store(s).

Step 6 involves another financial analysis to see what impacts if any the new and relocated sites would have on the overall financial performance.

Step 7 is the last step in the optimal store location process. That step is to incorporate all of the results (market size, store location, and optimum store network) into the ICI marketing and strategic planning documents.

Conclusions. This paper outlined the methodology that was successfully used to quantify the American retail paint market. ICI used this process to expand its retail network from 2000 through to 2005. In 2008 ICI was sold to AkzoNobel who immediately sold parts of ICI to Henkel, and integrated ICI's remaining operations within its existing organisation. This sale and the associated corporate restructure caused considerable change in marketing directions allowing for the first time the selling of Glidden paint products to mass market centres such as Home Depot.

This change in marketing strategy caused the traditional Glidden retail store network to decline to about 420 stores nation-wide, with the subsequent effect that ICI (Glidden) gave up some of its profit margin to third-partner retailers in exchange for higher sales volume.

УДК 50.03.05 +535.39(81)

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ИНТЕРСУБЪЕКТИВНЫЕ ТЕХНОЛОГИИИ ГОСУДАРСТВЕННОГО УПРАВЛЕНИЯ

Резюме. *В работе анализируются особенности интерсубъективных технологий государственного управления. Обсуждаются отличительные особенности и достоинства интерсубъективных технологий государственного управления, сформулированные на основе эвергетической модели государственного управления. Отмечается, что полилогические или мультиакторные, полностью децентрализованные сети в управлении и обучении, иных сферах жизни человека превосходят в скорости и качестве решений монологические: привлечение граждан в том числе гражданского общества к управлению государством позволяет не только снизить напряженность отношений между классами и группами, руководящим монолитом и гражданами, но и со временем отказаться от привычных форм государственного управления в пользу управления интерсубъективного. Эвергетика исходит из «суперпозиции» субъекта и объекта управления, «неоднородности» сообществ и акторов, выступающих и как исследователи, и как субъекты, участвующие в принятии решений, субъект и творит, и познает мир: актор находится «внутри» объекта (общества) и коммуницирует с другими акторами в общей для них проблемной жизненной ситуации. Представления эвергетики о продуктивности мультиагентных и мультиакторных технологий управления могут служить основой для построения типологии и разработки единой схемы интерсубъективного управления государством.*

Ключевые слова: *интерсубъективные технологии, государственное управление, мультиакторное управление, моноакторное управление.*

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