

How They Shop the Supermarket:

*An Electronic Study of Shopper Behavior
During Purchases of One Million Items
From a Suburban Supermarket*



The Inaugural PathTracker™ Report

2004

“PathTracker™ provides the opportunity to put category management into the perspective of the whole store, just as category management puts the perspective of a brand into the context of the category. *PathTracker™ is a whole store tool.*”

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How They Shop the Supermarket

The PathTracker™ Inaugural Report

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How They Shop the Supermarket

Executive Summary

PathTracker™ is an electronic shopper monitoring system that observes the paths and behavior of shoppers from the point at which they select a cart or basket to the checkout register. Their purchasing behavior, whether just browsing or buying is inferred from the direction and speed of their travel, the time they are spending and the products they purchase. This inaugural report covers more than one million purchases over a five month period in a new suburban supermarket.

Objectives

The goal of the study is to learn how shoppers *really* shop the supermarket, so that store design and merchandising can most profitably meet the needs of the shopper. We have searched for profits for both the retailer and the manufacturers whose products are being sold.

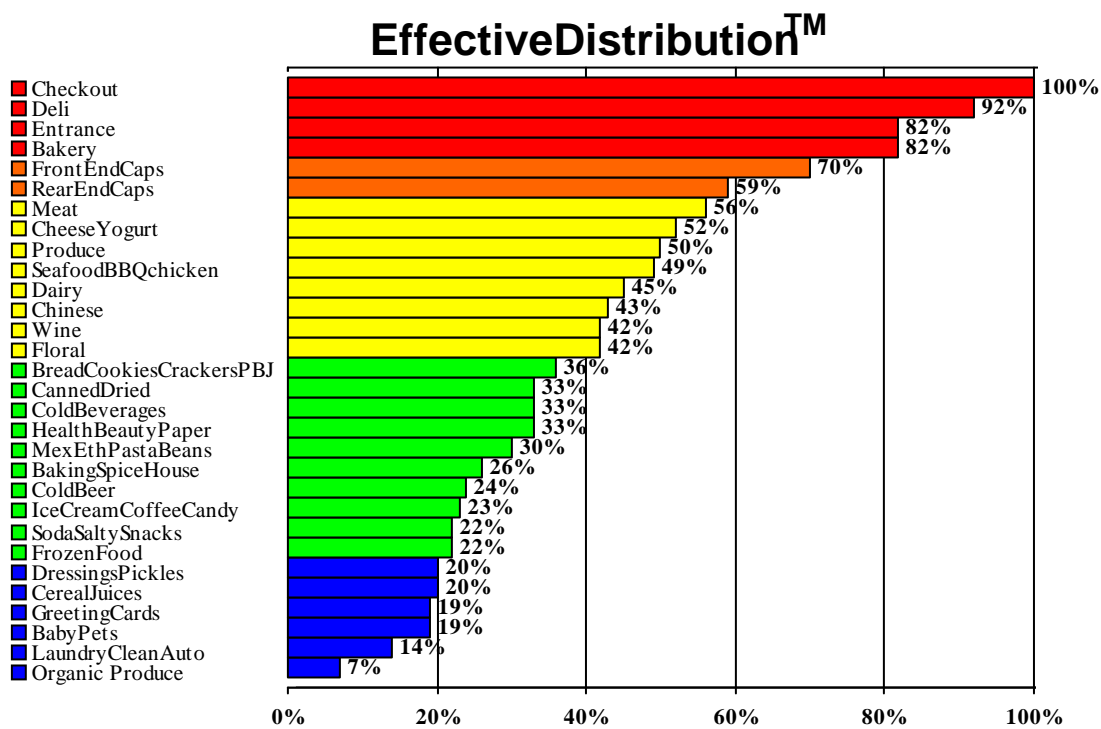
Methodology

Electronic tags emit coded signals which are mapped from an array of antennae around the store's perimeter. Path data is analyzed for individual shoppers as well as aggregated to provide composite views of shopping in the store. Applying the PathTracker™ Tool Suite to the data identified a series of key learnings or hypotheses for further study and validation.

Key Learnings

- **The Location Hypothesis** – 85% of a shoppers behavior in the store can be accounted for by their location, rather than the products in front of them. This means, to an extent, that trying to answer the question of how shoppers shop for this or that item is pointless, and possibly even misleading. The question should rather be, how will shoppers behave in this location? The answer to that question provides guidance for the type of products appropriate to the location.
- **The Product Hypothesis** – Some products overcome location effects and drive behavior regardless of where they are located. Baby food and the soup wall are examples. Some categories, like dairy, may define the structure and locations of the store.

- **The Shopper Cohort Hypothesis** – There are cohorts of shoppers in the supermarket that should be catered to: C-store shoppers, club store shoppers, food service shoppers. Attempting to get a quick-trip C-store type shopper to buy from a layout designed for stock-up shoppers is a mistake. Separate sections of the store should be designed for each cohort, with secondary product placements as needed.
- **EffectiveDistribution™** – It is not adequate to simply get products into the store, they must be placed where shoppers go. Some places are visited by 100%; and others by 7%. The impact on sales and profits is obvious.



- **The Checkout Magnet** – Shoppers behave as if drawn by an irresistible force toward the checkout and beyond. Their speed of shopping goes up as they near the checkout.
- **The Aisle Blow-Back Hypothesis** – There is genuine resistance by shoppers to go down the center-of-store aisles. On average, only one out of seven shoppers visit these areas.
- **The Super Zone Hypothesis** – There are four large areas in the store that create their own shopping styles: racetrack, center-of-store, produce-plus and “C-store.”

- **The Purpose/Pattern Hypothesis** – About half of shoppers’ behavior is organized and systematic. The other half is wandering and inefficient.
- **The Posture/Viewpoint Hypothesis** – Except on the racetrack, shoppers purchase nearly two-to-one on their left side and, on average, about 18” below eye level.
- **Basket Shoppers** consistently shop the produce+ area and racetrack, and are less likely to visit the C-store area or center-of-store aisles, except for frozen food and the first two or three aisles they come to that provide access to the checkout area from the rear of the store.

The Future

PathTracker™ both confirms and amplifies independent studies of shopper behavior. The location hypothesis meshes with studies showing that the bulk of shoppers product purchases are unplanned, the low value of EyeShare™ agrees with studies that show that shoppers do not notice or look at the vast majority of displays they pass and others have noted the resistance of shoppers to entering aisles (the blow-back hypothesis).

Further studies of the data in the appendix of this report, as well as new measures from the inaugural PathTracker™ store will probably provide additional important merchandising principles. Of immediate interest is the development of a daily or weekly management report that spotlights profit potentials.

Subsequent installations will provide a better view of shoppers across the supermarket business nationally and internationally, as well as for other retail channels for both disposables and durables.

Every application will build on the suite of shopper insight tools, particularly EffectiveDistribution™, DoubleConversion™ and BuySpeed™.

How They Shop the Supermarket

The PathTracker™ Inaugural Report

June 2002

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With the advent of effective local electronic tracking technology, it has become possible to develop an unprecedented, quantitative view of shoppers' activity and behavior in the retail environment. This inaugural PathTracker™ study represents data on *more than one million* individual purchases. This alone distinguishes the methodology from qualitative studies, and even observations and interviews of a few hundred shoppers.

Goals and Objectives

The purpose of this study is twofold:

- To increase retailers' profits by showing how to better meet shoppers' needs, and thereby to increase sales and profits.
- To increase manufacturers' profits by putting sales of their products into the overall supermarket context, allowing them to leverage the new retailer knowledge.

Achievement of the first goal requires identifying existing merchandising flaws and ferreting out missed opportunities to more closely match customers' needs as expressed by their shopping patterns and habits. PathTracker™ does not provide guidance on how to maneuver and manage shoppers, but rather shows how to work with the natural flow and purchase patterns of shoppers.

The profit potential is huge, since increases of sales by a few percentage points can have outsized

effects on profits. In order to keep our eyes on the profit ball, throughout this report profit opportunities will be called out with italicized sections identified as *Eye on profits*.

To achieve the second goal, manufacturers are invited to “look over the shoulder” of the retailer as this powerful new tool changes the face of retailing. Wherever the italicized *Eye on profits* sections occur, specific comments addressing manufacturer opportunities will be made, as appropriate. In addition, manufacturer clients will receive a specific review of their categories as reported in this top-level PathTracker™ data. More detailed studies at the brand and individual SKU level may be commissioned.

Methodology

PathTracker™ is a merchandising system based on the behavior of shoppers in the retail environment. Several sources of information are integrated to make reasonable inferences about the density, flow, shopping characteristics and thinking of the shoppers. These sources include the continuous locations (paths) of nearly all shoppers expressed as series of xy coordinates, purchase records of all shoppers (date and time stamped for each checkstand), a CAD map of the store and its fixtures, the locations of all products in the store (including their height from the floor). In addition to these databases, information on promotions (advertising, secondary displays, etc.) can be integrated to provide a rich mosaic of behaviors and motivations.



Cart Tag



Antenna

PathTracker™ goes beyond sales analysis to show not just the pattern of purchases, but the patterns of behavior leading up to purchases. This provides an unprecedented view for retailers of wall-to-wall shopping behavior, as a basis for more profitably managing merchandising. For manufacturers, the same view displays their products in context, clearly identifying potential strengths, weaknesses and opportunities, threats.

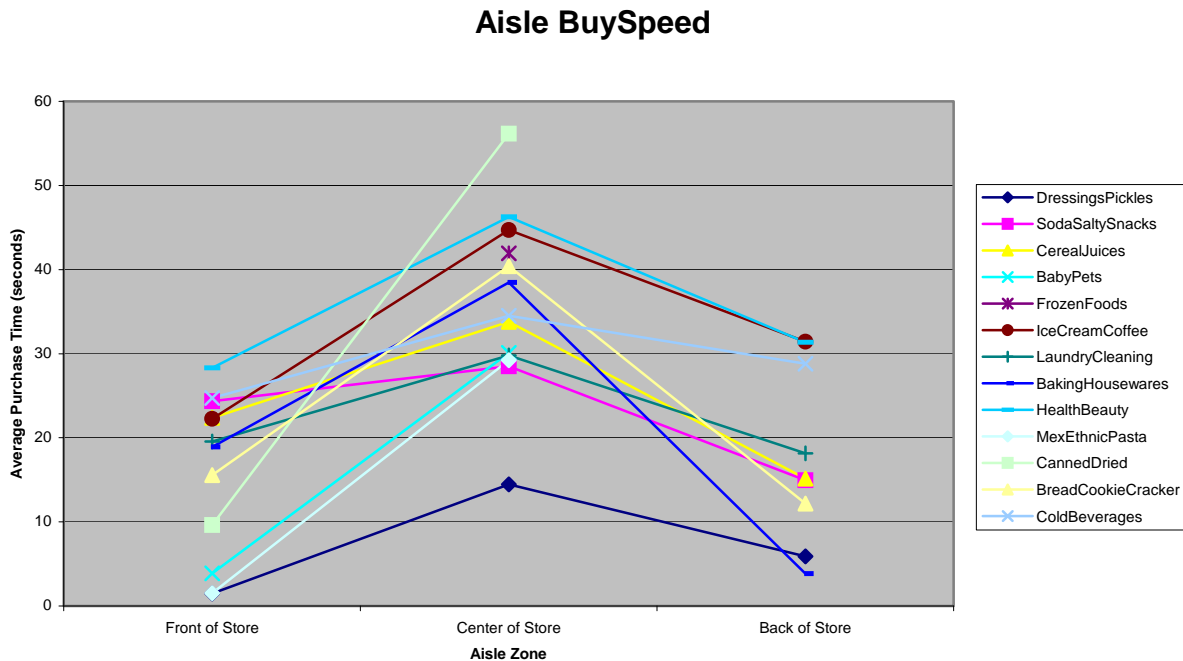
Given the slim net profits (usually one or a few percent), and the high fixed cost structure (but with reasonable incremental margins), increases in total sales of even a percent or two can result in a doubling of profits. PathTracker™ is designed to ferret out flaws in merchandising that when corrected will result in such increases in sales and profits. Each tool in the PathTracker™ suite is designed for this express purpose.

Key Learnings

Before looking at the detailed findings, and the tools provided by PathTracker™, we should look at some of the most important overall features that have emerged from the study. As we proceed through the various layers of the report, the rationale for some these points will become clearer as specific observations confirm them again and again. Shoppers' behaviors in the supermarket are complex, but they are understandable, too.

The Location Hypothesis

Location, Location, Location – The most striking single finding from PathTracker™ is that location is the dominant factor influencing shoppers' behavior in the store. For example, how fast shoppers shop is governed by where they are in the aisle, not on the products in front of them. The pattern is consistent, aisle after aisle, across 11 of the 12 aisles in the test store:



We will discuss this in some detail in the Center-of-Store Aisle analysis, but it is apparent that the pattern of shopping speed repeats across aisles.

An important implication is that if a product does not happen to be on a shoppers path, they will simply *not* buy it, rather than go look for it.

So it is location, location, location. On reflection, this point may seem obvious – and it parallels the old real estate dictum. The point may be commonly understood by retailers. But maybe not. Many of the overlooked merchandising opportunities in the test store are seen in other supermarkets across the country, too. And manufacturers’ distance from the retail floor, and attention to the details of *their* products can divert them from this vital point. PathTracker™ provides the opportunity to put category management into the perspective of the whole store, just as category management puts the perspective of a brand into the context of the category.

PathTracker™ is a whole store tool. Although you can zoom in to see the detail of the individual SKU level, zooming in without surveying the surface with a wide perspective may distort the view.

The Product Hypothesis

Location vs. Product – Although 85% of the shopper’s behavior is determined by their location, when it comes to the final purchase, the product alone (not its placement) determines whether the shopper will put it in their cart. This means that shoppers will not purchase a product they do not want, no matter how well it is placed. (And they cannot purchase what they do not see or pass by – see the next section on EffectiveDistribution™.) Where a pattern of behavior is repeated in similar locations, location may reasonably be inferred as the controlling factor. Where no such pattern is apparent, we look for product characteristics to influence behavior. And, again, the

product controls the final purchase decision. In the tension between product and location, certain large impact categories (such as dairy and produce), if relocated *en mass* would obviously change the patterns of shopping. But secondary placement of these items does not necessarily



Refrigerated Dressings – Produce Department – beginning of trip
BuySpeed™ = 36 seconds

Room temperature Dressings – Grocery Department – end of trip
BuySpeed™ = 10 seconds

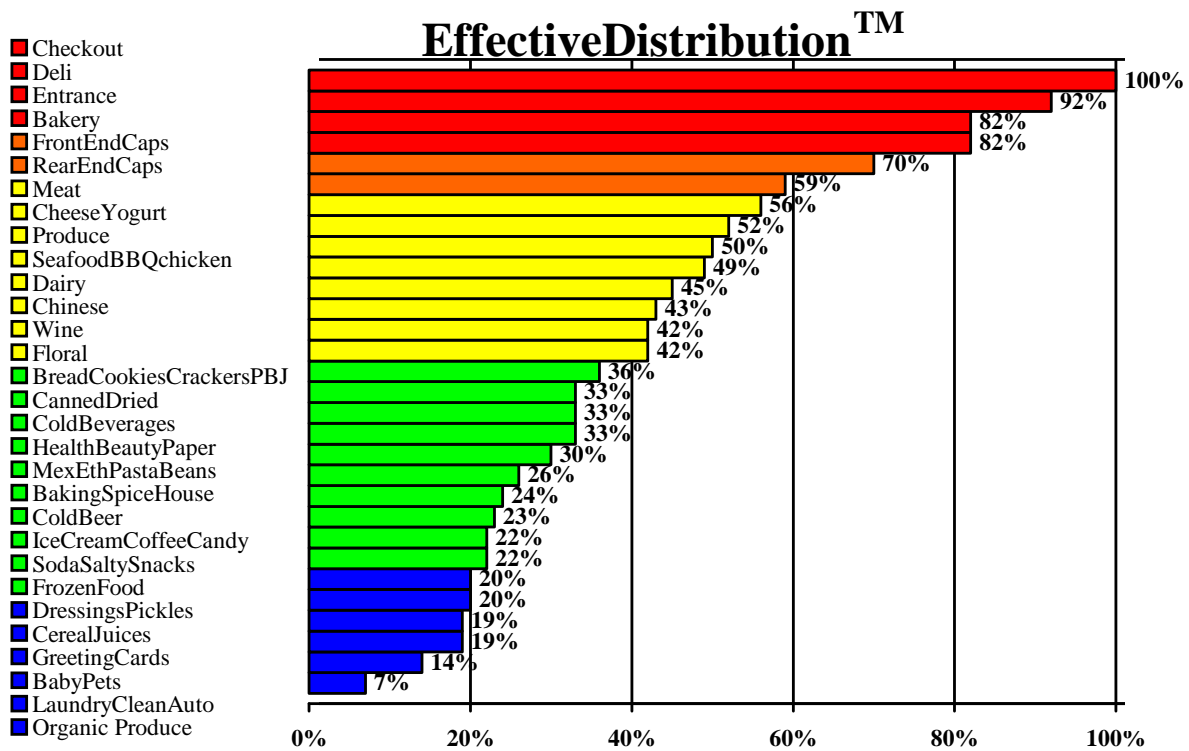
alter the patterns of their secondary locations. For example, dressings sold in produce take longer to buy (typical of the produce section) than those on aisle one (typical of items near the end of the shopping trip.)

EffectiveDistribution™

It is necessary for shoppers to not only *see* the products (which can be done from a distance) but they must actually visit the area immediately adjacent to the display in order to complete a purchase. When a product is immediately adjacent to a shopper, we say that the product has

been *effectively distributed* to the shopper. This is a simple but important concept. It is common to measure the distribution of products by determining the percentage of the national market to which the product is distributed, measured as a percentage of All Commodity Volume (ACV). However, this presumes that if the product is in 80% of the stores, that it is reaching 80% of the shoppers.

This is not true. For example, if only 20% of shoppers in the distributed stores visit the shelf or display where the product is offered for sale, the *EffectiveDistribution*TM will be 20% of 80% or only 16%, a long way from the original 80%.

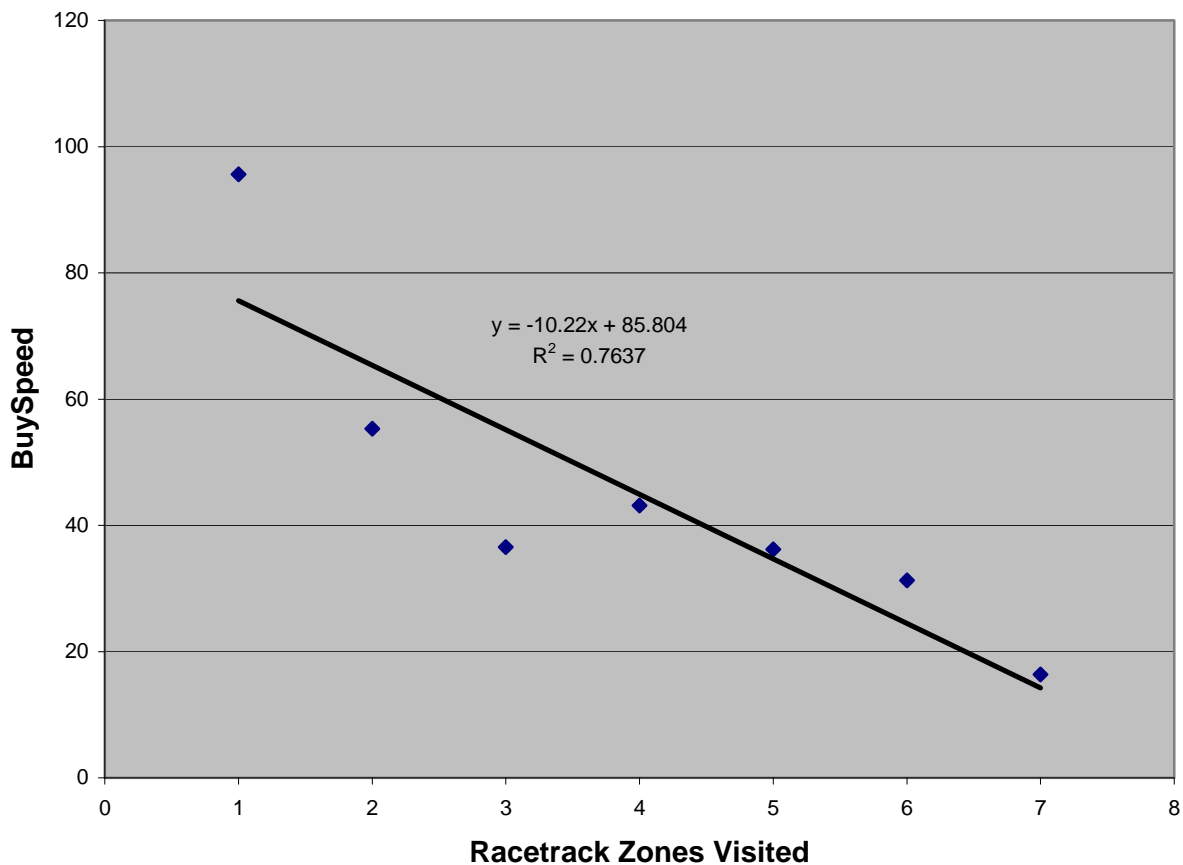


The Checkout Magnet Hypothesis

Shoppers are truly psychocybernetic within the store. They come through the front door with a goal in mind. That goal is the checkout and exit (and beyond.) The shopping trip is not so much

an event, such as a movie or sports contest, as it is a road or pathway (or even a detour) on their way to somewhere else. Within the store we can refer to this as *the checkout magnet*. The checkout and exit is drawing the shopper away. This may seem obvious since all shopping paths lead to the exit. But it is manifested also in the quickening pace of shopping within sight of an open (and short) checkout line (and by steadily decreasing time spent *per item purchased* as the shopper moves around the perimeter racetrack.) The shopper will hasten to complete any

BuySpeed vs. Zones Visited



shopping in order to get into the short line before other shoppers can lengthen the line.

The Aisle Blow-Back Hypothesis

Sales near the midpoint of the long center-of-store aisles is good, based on the number of shoppers who visit there. However, the low number of shoppers who visit the mid sections of these aisles is evidence of an

apparent force originating in this

area whose tendency is to “blow-

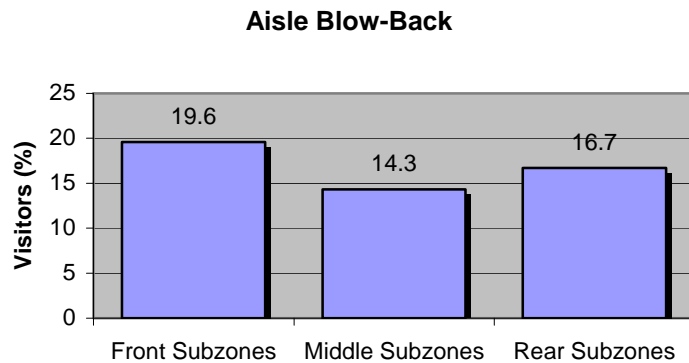
back” against the shoppers entering

the aisle, pushing them away from

the center sections. This effect is

seen consistently from aisle to aisle

and is shown in this chart:



This effect is also manifested in the relatively large proportion of excursion pattern shopping trips. An “excursion” pattern occurs when a shopper enters an aisle but turns around and exits the aisle without traversing to the opposite end.

The Super Zone Hypothesis

Shopping is not all alike – The behavior of an individual shopper is strongly influenced by where they are in the store; even more than by what products are in front of them. To understand the behavior of a shopper in front of any product or section, it is more important to consider the location in the store than what the products are. For example, although “excursion” shopping means that there are many more shoppers visiting areas near the end of aisles, their shopping there is faster, less deliberative, and results in fewer purchases. There are important exceptions to this rule: the baby food wall and the soup wall.

In seeking general principles, the aisles in the center of the store are most clear-cut, because there are a dozen aisles and a dozen opportunities to observe recurring patterns. However, each of these areas (or superzones) have their own shopping characteristics: 1. center-of-store aisles, 2. racetrack perimeter, 3. produce, 4. “convenience store.” This four-way classification of shoppers is based on four general *locations* in the store. There are two additional four-way methods of classifying shoppers trips, based on the length *or* the pattern of the trips. Thus, trips and shopping can be classified by location, length or pattern. TripType: Length™ can be determined by length in either time or distance. TripType: Pattern™ is discussed in the next section.

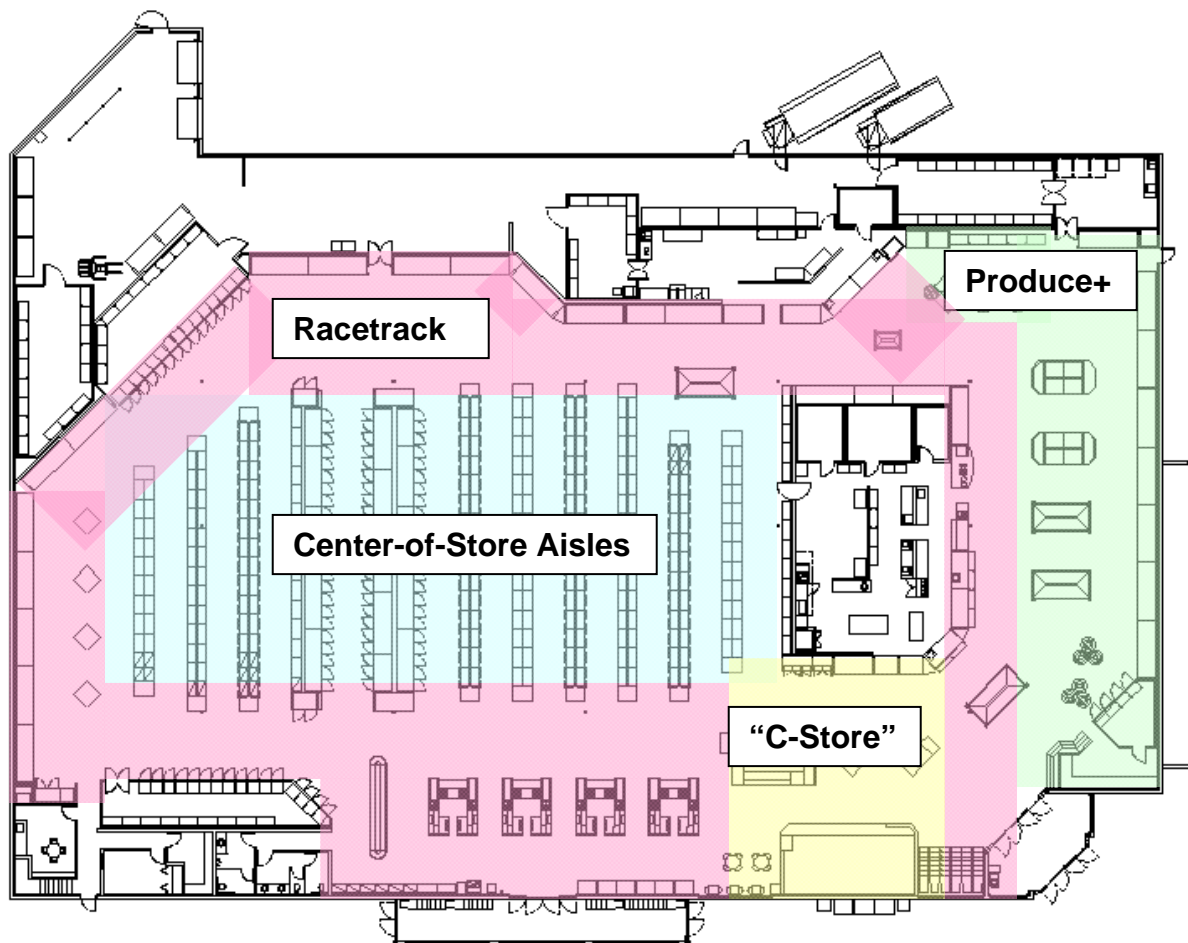


Figure 1. The four superzones: center-of-store aisles; racetrack; produce+; "C-store"

The Purpose/Pattern Hypothesis

The idea of purpose or goal of the shopping trip was mentioned in comments above on the checkout magnet. Further evidence of this is that we can define four distinct patterns of shopping behavior, *any one or more of which can occur on a single shopping trip*. These patterns are broadly defined as 1. racetrack (or perimeter), 2. aisle (excursion, traverse and zigzag), 3. destination and 4. C-store. (Lack of pattern we describe as loiter or wander. All are discussed in more detail below.) The fact that the purpose component of these patterns makes up more than half of a typical trip adds to the evidence for purpose in the paths of shoppers. Since these patterns are not patterns of products, it lends further credence to the idea that shoppers enter the store with a formed or emerging intention to “shop x% of the store in such-and-such manner,” and not “to buy specific items”. This does not imply that there is *no* intention to buy specific items, but that a large component of the trip is specified by a pattern, not the products involved. The implication here is that profits can be had by merchandising to the patterns, more than by focusing on the products. Again, relocation of large impact categories may alter patterns.

The Shopper Posture/Viewpoint Hypothesis

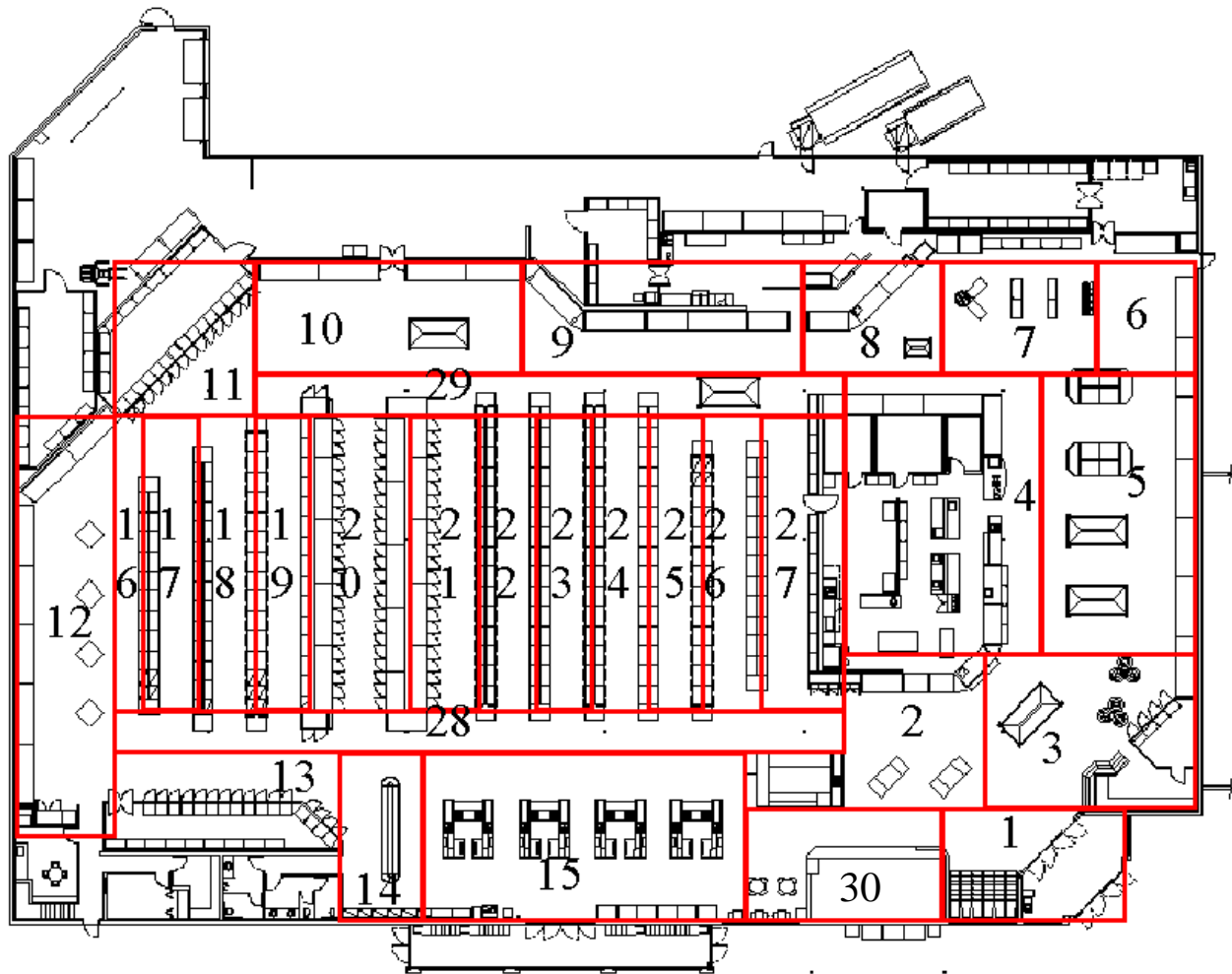
Look where they are buying. The “average” location of products shoppers are buying, at least from wall type displays, is to their left and about two feet below eye level. Perhaps they “shop” at eye level (PathTracker™ has no data on this) but they definitely buy, on average, two feet below this level. The notable exception to this is the racetrack which is circumnavigated in the counterclockwise direction, but close to the outer wall (away from the rear end-caps). This practically forces purchases to be made on the right.

Overall Perspective

PathTracker™ provides an incredible amount of detailed information about shoppers and their behavior. In order to make efficient use of this information it is necessary to stand back and take a very broad view of in-store behavior. Everyone interested in the retail process likely has questions that PathTracker™ *might* answer. And this is good. But it is important to let the information speak for itself before getting too detailed in our queries. Otherwise, we are in danger of missing the value of any fresh perspectives offered, and are in danger of simply confirming what we have thought all along.

Most of the observations that follow have been confirmed by multiple measures. The emerging consistency of the view gives us some confidence of its correctness. However, given the single store source of the data, and other constraints, we must consider the various findings as hypotheses calling for further study and validation. We will begin by first looking at overall shopping patterns and then use this framework to understand the results revealed by the various PathTracker™ tools.

Familiarity with the test store is essential in understanding many of the findings. Here is a diagram of the store subdivided into the 30 departments, aisles or *zones*. As noted above, these are further divided into subzones and categories. But for now we will focus on the larger zone perspective (subzones are mapped in the appendix):



- | | |
|-------------------|---|
| 1-Entrance | 16- aisle #1-Dressings, sauces, pickles |
| 2-Bakery | 17- aisle #2-Salty snack, picnic |
| 3-Floral | 18- aisle #3-Breakfast cereal, juices, drinks |
| 4-Deli | 19- aisle #4-Baby, pets |
| 5-Produce | 20- aisle #5-Frozen foods |
| 6-Organic produce | 21- aisle #6-Ice cream, coffee, tea, candy |
| 7-Wine | 22- aisle #7-Laundry, cleaning, auto |
| 8-Seafood | 23- aisle #8-Baking, spices, housewares |
| 9-Meat | 24- aisle #9-Health&beauty, papergoods |
| 10-Cheese, Yogurt | 25- aisle #10-Mexican, ethnic, pasta, beans |
| 11-Dairy | 26- aisle #11-Canned, dried |
| 12-Cold beverages | 27- aisle #12-Bread, cookies, crackers, PB&J |
| 13-Cold beer | 28-Front end caps |
| 14-Greeting cards | 29-Back end caps |
| 15-Checkout/exit | 30-Chinese restaurant |

The entrance is at the lower right hand corner (1), but the checkout and exit (15) makes an

alternate entrance. The in-store bakery (2) and service deli (4) are adjacent to the large produce area (6). As will be seen, shoppers tend to travel up between the deli and produce and then proceed across the back of the store passing the wine (7), seafood (8), meat (9) and cheese (10) to the far left, back corner where the dairy (11) is located. The cold beverage (12) wall is on the left and leads down to the beer cooler (13) on the lower left. The long grocery aisles are in the center of the store from 16 through 27. Photos of the produce/deli aisle, back aisle and chilled beverage aisles:



Looking south through the produce and service deli areas. The racetrack begins here and proceeds along the left side of the photo.



Across the back aisle from the wine to the dairy department. The second major leg of the racetrack.



The cold beverage wall on the east side of the store (right). This is the third leg of the racetrack. Aisle #1 of the center-of-store aisles is on the left.

This provides some perspective on the traffic flow as revealed by the average direction of shoppers in each of the 170 subzones. This traffic flow data plays an important part in some of the PathTracker™ tools.

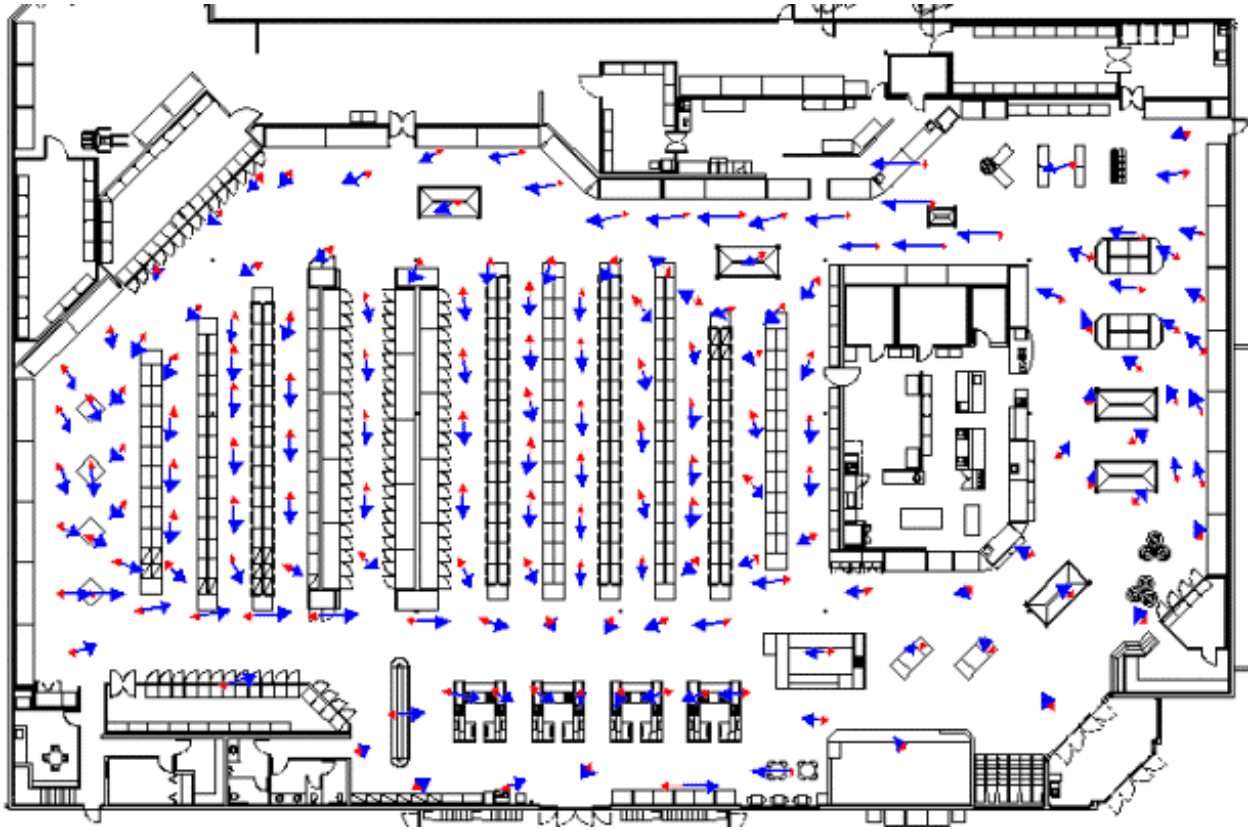


Figure 2. Traffic Flow. The length of the blue arrow is proportional to the strength of the flow in that direction.

The length of the blue arrows is a measure of how strong the flow is in that direction, and the red arrows measure the amount of traffic going in the direction opposite to the main flow. Since some subzones are larger, but still have only a single arrow, the density of the arrows is of no consequence. Again, the length of the arrow is a measure of how strong the flow is in that subzone.

When combined with a shopper density map, the flow map gives a pretty good *view* of where shoppers are going. Understanding these visual aids is essential to interpreting the quantitative measures in the tools that follow. Shopper density:

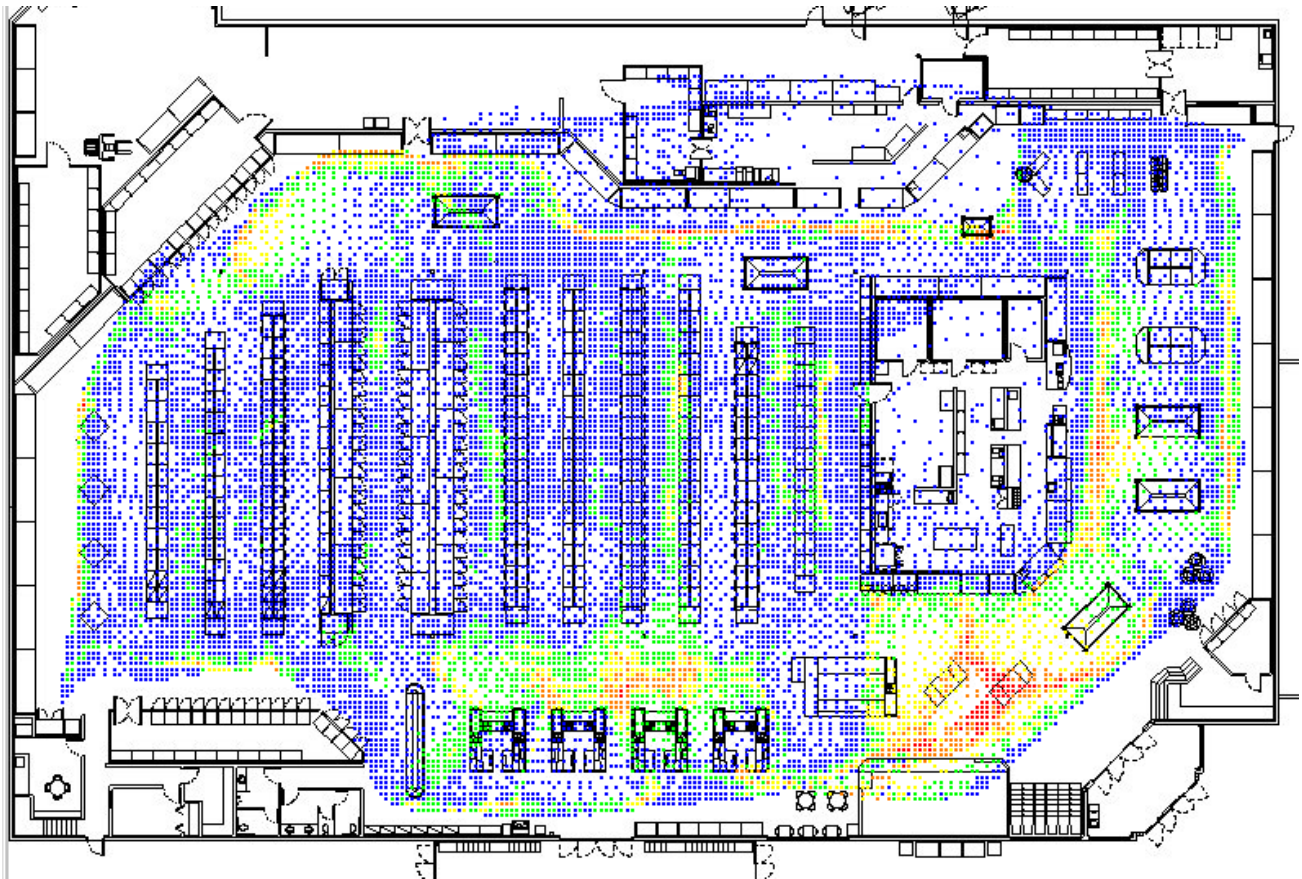
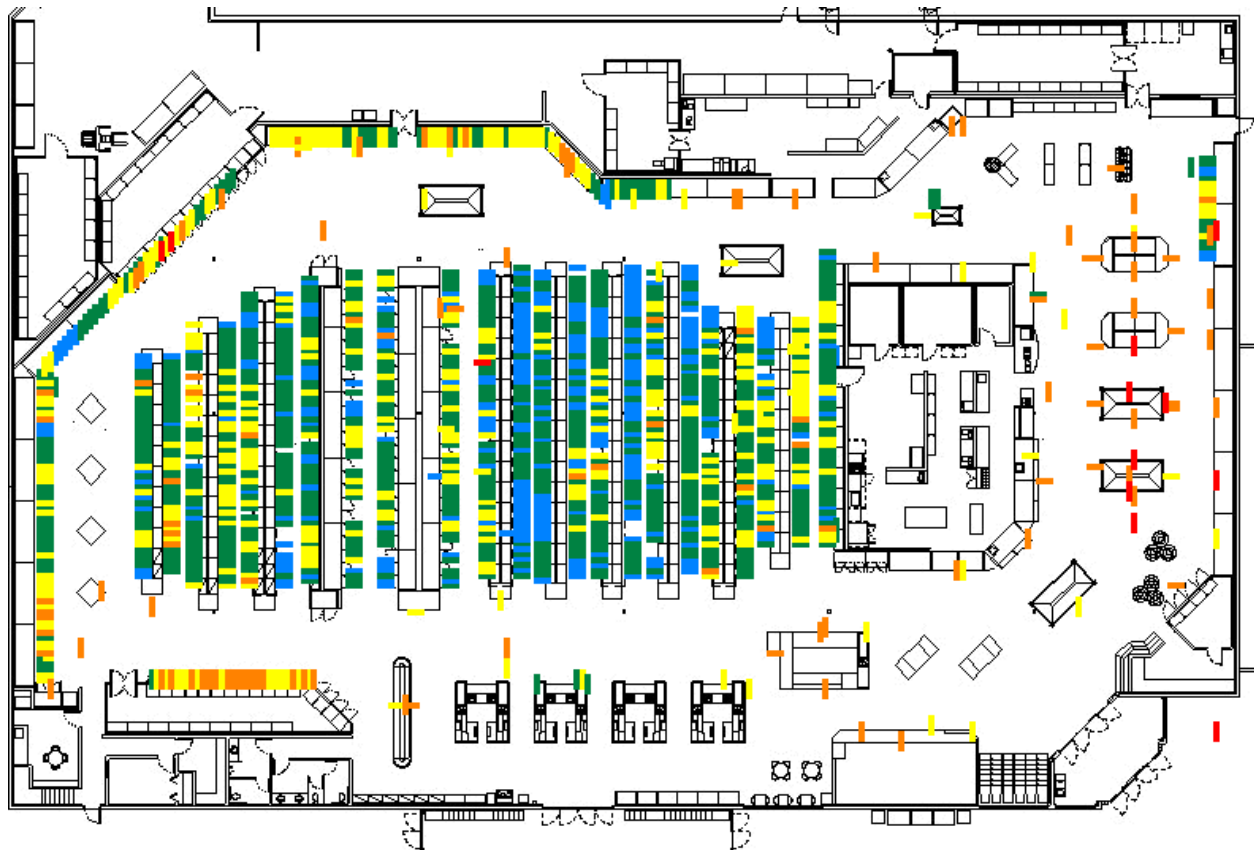
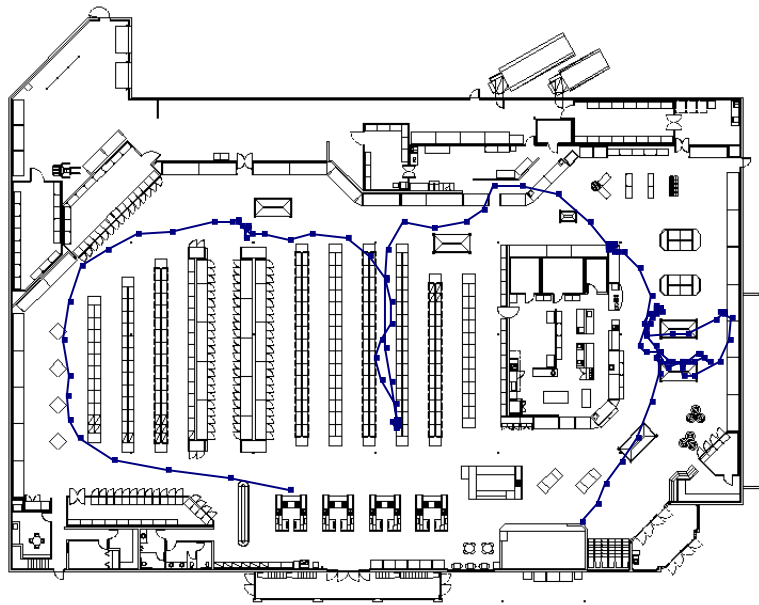


Figure 3. Shopper density. Red = "hot spots", most density; blue = cold spots, least density; orange, yellow and green are intermediate (in that order) between red and blue.

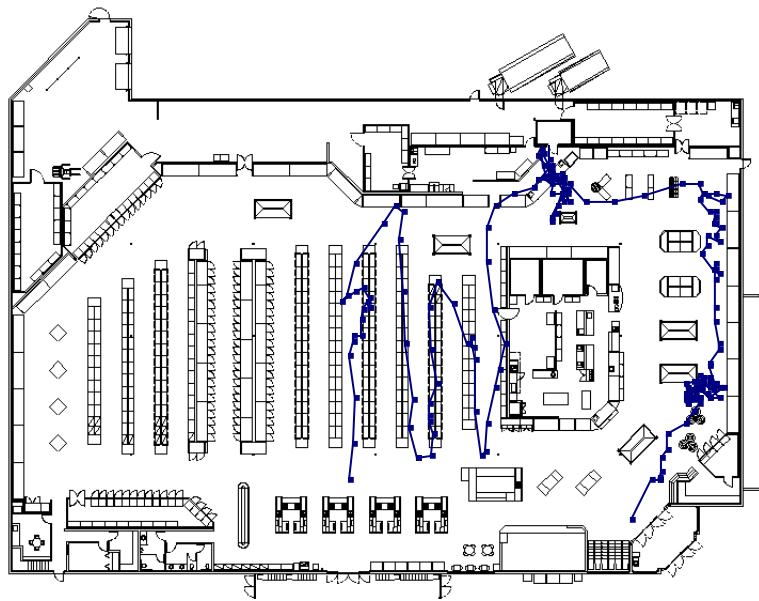
In addition to the flow and density maps, sales density provides an additional important perspective:



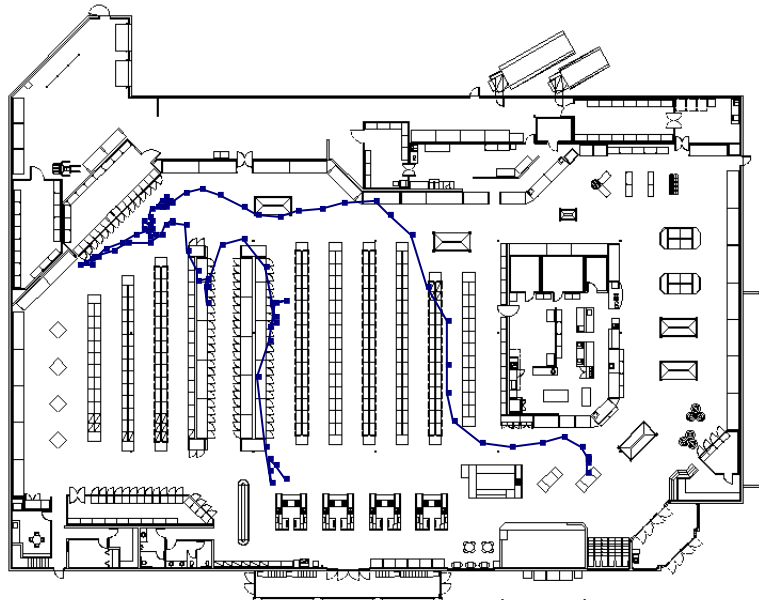
Comparing the density and flow maps shows a definite “racetrack” pattern around the perimeter of the store, pretty much along the path shown in the three photos above. In fact, visual inspection of hundreds of individual shopper paths has led to the identification of seven relatively distinct traffic patterns. Examples of these are shown here:



RaceTrack with Excursions. Notice the trip down and back in the center of the store. There is also something like an excursion in the produce area. Racetrack is, of course, the dominant path around the perimeter of the store.



Racetrack with ZigZag – up and down aisles. Notice some Wander (or Loiter) in the produce and seafood areas.



A Destination trip, with one small Excursion while returning from the dairy case to the Checkout. Travel is directly from the entry to a single location, and return directly to checkout.

In addition to the trips illustrated here, there are two others. First is the Traverse, which is a passage along the full length of an aisle, with an exit from the other end. For our purposes, a ZigZag is actually multiple Traverses in alternately opposite directions. However, often a Traverse occurs without a return trip and we consider this a simple Traverse.

Of even greater significance are those trips that remain in the area between the entry and Checkout number 8, which is the one nearest the entrance (except for the service desk.) There is a large number of these, and we designate these as "C-store." This will be discussed in some detail later.

The relative importance of these TripType: Patterns™ is shown in the following tabulation of 57,262 trips:

TripTypes: Pattern™										
RACETRACK		ZIGZAG		EXCURSION		TRAVERSE		DESTINATION	"C-STORE"	WANDER (other)
<i>total</i>	<i>wander</i>	<i>total</i>	<i>wander</i>	<i>total</i>	<i>wander</i>	<i>total</i>	<i>wander</i>	<i>total</i>	<i>total</i>	<i>total</i>
36.1%	20.3%	5.3%	0.9%	7.8%	4.5%	5.8%	3.9%	2.5%	19.9%	22.7%

For the first four of these trip types there are both total figures and then a break-out of how much of those totals are due to wander/loiter. For example, 36% of all the traffic in the store is on the perimeter racetrack. However, 20% of that racetrack is not contributing to steady counter-clockwise progress around the store. This 20% represents wander and/or loiter along the way, as well as clock-wise travel. The substantial amount of Excursion shopping is confirmed by other statistics, discussed more thoroughly under Aisle Analysis. ZigZag, though significant, does not represent the level of this type of shopping that is commonly expected, even by retailers and

other serious observers.

Of perhaps greatest practical significance is the substantial amount of “C-store” travel. In fact, since the beginning of the racetrack is also the beginning of the “C-store” and a percentage of the other Wander is doubtless in this area, it is likely that 20% understates the importance of this type of trip. Other statistics suggest, too, that “C-store” is larger than shown here.

We can evaluate trip types also by length of the trip, either in terms of share of the store visited or of time spent in the store:

		TripTypes: Length™			
		QUICK	FILL-IN	ROUTINE	STOCK-UP
		<2 minutes	2-10 min	10-20 min	20+ min
ALL SHOPPERS	100.0%	11.9%	36.2%	29.4%	22.5%
<25% OF STORE	46.0%	100.0%	60.0%	18.8%	30.0%
25-50% OF STORE	38.2%	0.0%	39.1%	60.3%	25.8%
50-75% OF STORE	14.8%	0.0%	0.9%	20.9%	39.3%
75-100% OF STORE	1.1%	0.0%	0.0%	0.1%	4.9%

We can also look at the total number of feet that the shoppers are walking in the store:

	ALL	QUICK	FILL-IN	ROUTINE	STOCK-UP
ALL SHOPPERS	100.0%	11.9%	36.2%	29.4%	22.5%
<250 FEET	8.7%	63.7%	3.4%	0.4%	0.3%
251-500 FEET	12.6%	34.0%	21.9%	0.8%	0.7%
501-750 FEET	12.0%	2.2%	29.5%	1.3%	0.9%
751-1000 FEET	12.9%	0.1%	28.5%	6.3%	0.9%
1000+ FEET	53.9%	0.0%	16.9%	91.2%	97.3%

The 20% covering less than 500 feet agrees with the 20% observed in the “C-store” pattern

observed above.

Classifying trips in this way shows that nearly half the shoppers spend 10 minutes or less in the store.* Also, nearly half visit less than 25% of the store. All of these observations tend to confirm the importance of the “C-store” type trip in this store.

Eye on profits – The Shopper Cohort Hypothesis

Keeping in mind that our goal is a few percentage points increase in sales, which can more than double profits, introduction of an explicit convenience store format may alone accomplish this goal. And it illustrates an important learning from PathTracker™: Do not attempt to figure out how to get shoppers to do this or that, rather capitalize on what they are doing. The C-store format simply leverages what a large cohort of shoppers were already doing. By careful observation of what they are doing, we can find opportunities to assist them in their shopping experience.

The question is: if the supermarket should respond to the C-store competitive challenge by explicitly incorporating a C-store within the supermarket, would this same approach to club stores, etc., work? The answers to this are not yet clear, but for this store an “occasion” center might be appropriate. As built, the four major components of such a center were dispersed, literally, to the four corners of the store: floral, wine, gifts (knick knacks) and cards. Recent

* This figure may be partially influenced by the size of the store – 38,000 square feet. This is less than the typical large suburban supermarket of 50,000 to 70,000 square feet in much of the country. However, many supermarkets in the northeast would be in this size range.

resets have located the gifts adjacent to the cards. Wine is within eyesight of the floral department.

We will now apply the PathTracker™ tool suite to four major areas of the store: the center-of-store grocery area (for which we have the most useful analytical data), the racetrack around the perimeter, the produce and adjacent service areas (floral, deli, bakery) and the C-store area.

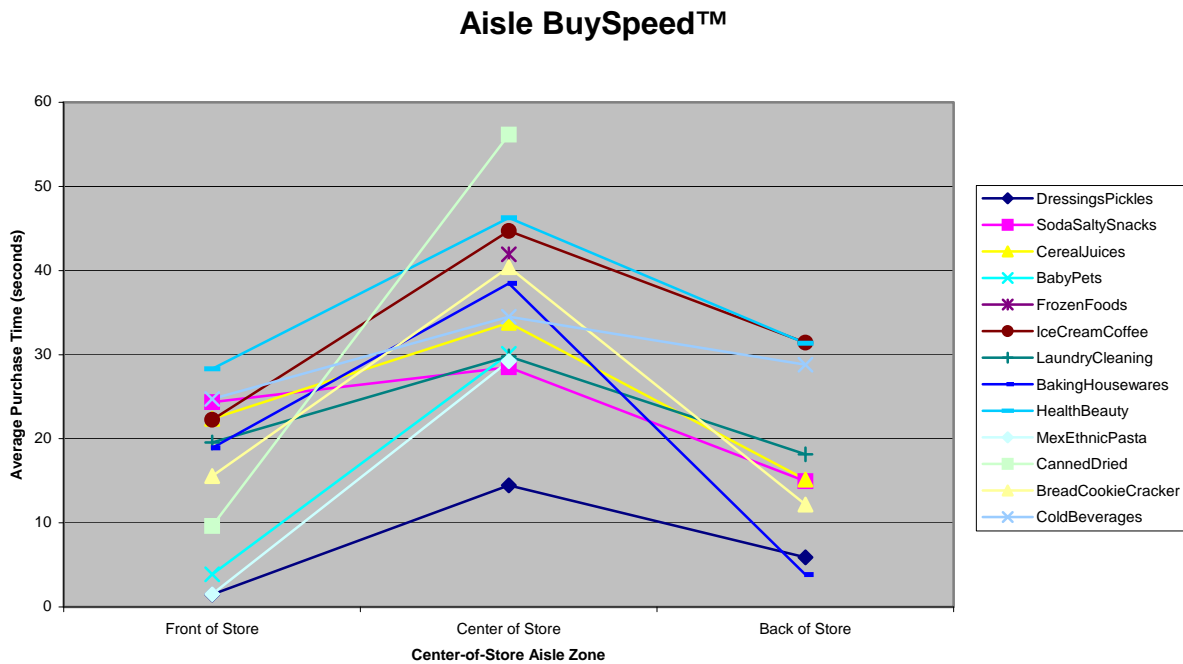
Explanation and illustration of each of the tools is detailed in the appendix.

Area Analysis – Center-of-Store Aisles

The center of the store consists of the 12 long (about 60 feet by 7feet wide) grocery aisles. There are structural differences, but they share in common that shoppers enter one end and pass some distance along the display which consists of a tiered wall or walls of merchandise. Every fixture is terminated on either end by an end-cap. Aisle 1 (zone 16) is the shortest and has the wall type fixture only on the west side, with highly variable island displays (pallets of soft drinks, etc.) on the east. The wide aisle 5 (zone 20) has frozen food in upright freezers with 30 inch doors on either side, with aisle 6 (zone 21) having freezers only on the east side. The fixtures between aisles 10, 11 and 12 (zones 25, 26 and 27) are shortened to make room for a free-standing coffin cooler at the rear of the aisles.

There are some striking differences in shopping characteristics, but the consistency of patterns in aisle after aisle demonstrates that the nature of the aisle and the shoppers position in it has a larger influence on the shopper's behavior than does the specific merchandise on the displays.

This principle is well demonstrated with the BuySpeed™ analysis of these aisles:



Bear in mind that this data has about 15% of the subzones removed as “outliers,” that is, they are statistically far from this “normal” data. We will look at *each* of these outliers shortly, as the reasons for their deviations from norms can be instructive.

The chart shows certain strong trends:

- For any given aisle, the fastest shopping tends to occur in the subzone immediately adjacent to the front endcap. Since this pattern repeats from aisle to aisle, it is unlikely to be driven by any specific merchandise. It is most likely driven by the strong magnet effect of the checkout lanes: when shoppers are near the checkout, their minds turn to exiting the store to go home, not to careful deliberation on products for purchase. This is

also consistent with the known flow of traffic from the back of the store to the front. The subzone at the front of the store will typically be the last one visited in that aisle.

- Shopping in the center of the store is a slow process. Again, since the pattern is repeated across many aisles, it is unlikely to be merchandise driven. It is more likely to be driven by the inherent difficulty of finding what you want on a large wall of densely packed items displayed *beside* you (as you pass) rather than in front of you. It is also possibly driven by the lack of traffic in these places, which facilitates more leisure in shopping and selection of products.
- Shopping in the subzone immediately adjacent to the rear endcap is substantially faster than in the center of the store, but not as fast as at the front of the store. This is particularly significant because this rear subzone is the one with the highest traffic in the aisle.
- Although the pattern of faster shopping at the ends and slower shopping in the middle of the aisles is consistent across aisles and categories, the absolute amount of time varies widely. For example, in the “CannedDried” aisle, shopping times zoom from 10 seconds for beans, chili and pasta to 56 seconds a few feet down the aisle at the dinner mix and instant potato sections. The averages across all aisles (less outliers) are 16 seconds for the subzone contiguous to the frontend cap, 36 seconds for the interior subzones and 18 seconds for the subzones near the rear endcaps.

The exceptions to these general trends, the outliers, are interesting and tend to confirm the rules outlined above. (“The exceptions prove the rule.”) The 15% of outliers (10 subzones) include the following examples:

- Salad dressings, both pourables and spoonables, are very fast purchases, even though they are in the middle of the aisle. However, this is not an ordinary aisle since it is wide enough to accommodate large island displays (such as pallets of soft drinks), and is a “double aisle” in the sense that cold beverages are on the opposite side of the large aisle. The width of the aisle may be significant because shoppers may approach the dressings face-on from some 20 feet away, even though they are in a central subzone. Whether this contributes to the rapid purchase, or the rapid purchase is inherent to the category will soon be known since the entire section was recently reset to the next narrow aisle over, trading places with the higher volume salty snacks. (There were no anomalies in BuySpeed™ on the cold beverage wall.)
- The penultimate display on the rear of the salty snack aisle had a BuySpeed™ of 3 seconds. But since this is a salty snack section adjacent to the end salty snack section with a BuySpeed™ of 15 seconds, it is perhaps not surprising.
- The rear-most section in the Baby&Pets aisle has an average BuySpeed™ of 54 seconds, well above any possible norm for that area. But this seems understandable given the plethora of varieties in very small jars, the similarity of labels requiring lots of reading, coupled with the emotionally charged importance of selecting food for the baby.
- The main frozen food aisle exhibits a nearly uniform BuySpeed™, with a slight increase in the rear-most subzone (53 seconds.) Otherwise, the average anywhere along the aisle is 42 seconds. These times (and the normal 45 seconds for the IceCreamCoffee in the adjacent aisle) are near those for baby food, Mexican sauces and canned soup. Purchases of frozen foods require a lot of time, and this is facilitated by the extra wide aisles

provided (necessary to accommodate opening doors.) The wideness of the aisles may be encouraging more leisurely shopping; the frosting of doors when opened may require more time for location and selection of products.

- Two of the HealthBeauty central subzones have abnormally low BuySpeeds™ of 5 seconds. One of these subzones contains toilet paper, a frequent purchase for which a low BuySpeed™ makes sense. Other items such as oral care, deodorant, feminine care, vitamins, etc., may have very rapid purchases because of brand loyalty. Once the shopper spots the brand, no further deliberation is required.
- At the back of the EthnicPasta aisle Mexican sauces and tomato products are requiring 46 seconds to buy. Both of these types of products have a wide variety of forms, flavors and strengths. Possibly this provides sufficient confusion or options to hold shoppers for the extended period.
- In the back of the CannedDried aisle there is the very slow BuySpeed™ (56 seconds) associated with the canned soup, and the adjacent fast BuySpeed™ of 6 seconds for canned fruit. The soup section is heavily shopped, with many varieties and optional forms to choose from. The potential for confusion has to be similar to that for the baby food, without the emotional complication. And, again, there is lots of reading required to be sure of selection of the desired items.

This is the extent of the outliers, with only one or two examples having inexplicable results.

This suggests that within limits, the lineal placement of categories on aisles can be done according to rational principles supported by hard data on shopper paths, densities and buying

behavior. The reasonableness of this proposition is demonstrated by a number of other measures that exhibit congruent patterns.

It is important to notice that our rule about location-location-location has limits. The 15% of exceptions to the rule cited above show that slavish acceptance of the rule would be a mistake. Although the “location” rule dominates the store, there *are* products and categories that override the rule. In the grocery section, the 15% discussed above represent products that control their shopping, rather than being controlled by the location. It is easily possible that there are other such products which simply coincidentally have been placed where “location” and “product” rules agree, and if moved to another location would take their shopping behavior with them. This possibility can be evaluated by resets in the test store or by similar studies in other stores with similar “locations” (they all have aisles) but with products allocated differently, particularly in terms of what is near the end of the aisle.

Some of the other aisle measures that follow patterns congruent with BuySpeed™* include:

	Side	EyeShare™	Side	EyeShare™	Dwell Time*
Front Subzones	W	43	E	52	11
Middle Subzones	W	58	E	68	23
Back Subzones	W	46	E	67	16

Notice that EyeShare™ (“GRP”) is significantly higher in the middle subzones than on either end. This is primarily a consequence of the greater amount of time spent in these subzones by both buyers and non-buyers than they do on either end. The higher EyeShare™ (“GRP”) on the back and east sides of the aisles is due to the large exposure to incoming traffic from the racetrack. This traffic sees the east side of the end of the aisle for some distance and time, but

* BuySpeed™ refers exclusively to the number of seconds a purchaser “dwells” in a subzone while making a purchase. The more generic Dwell Time refers to all shoppers in the subzone, buyers as well as non-buyers.

not the west side of the end of the aisle. This places a premium on the east side of the aisle of the back end-of-aisle displays. (See the map in the appendix.)

	Visit	Shop	Purchase	items	Order-of-10™
Front Subzones	19.6%	10.4%	1.9%	3,861	5.5
Middle Subzones	14.3%	10.6%	2.6%	5,258	5.1
Back Subzones	16.7%	10.6%	1.9%	3,780	5.0

Again, the patterns are consistent. There is a lot more traffic visiting the front and back zones than those in the middle. This is not a consequence of the fact that there are more middle zones, since all of these numbers represent the average value for the designated zones, and all zones are approximately the same size. The much larger numbers of visits near the aisle ends are a direct consequence of the large amount of excursion shopping, with shoppers entering the aisle for some distance and then retracing their steps to exit from the same end. The relative constancy of the percentage of shoppers who shop the subzones shows that a significant component of the visit data is just traffic passing through, with a “constant” 10% of all shoppers stopping to shop.

Although the averages across aisles show some constancy, there are significant variations from aisle to aisle. For example, Dressings/Pickles, all but the front zone of Pet Food and Supplies and the Laundry aisle all have half the average level of shopping. Health/Beauty and Bread/Cookies have about 50% more shopping than average. Frozen foods have high shopping at the ends and low in the middle.

Of greatest importance is that there is 40% more buying going on, per zone, in the middle zones than those on the ends. Again there are variations from aisle to aisle and within aisle. We will ferret out significant deviations for focus by looking at the VitalQuadrants™ on

DoubleConversions™. This is important because of the mass of individual measures and we must be able to sift for the “vital few” (Juran) with some efficiency.

The Order-of-10™ data* shows that shoppers proceed from west to east, with each aisle having a later average purchase, *with the exception of the frozen food aisles*. The higher Order-of-10™ scores for frozen food clearly indicates that shoppers are returning to these aisles at the conclusion of their shopping trips. It also shows that the force of the “product” in this case is strong enough to overcome its “location.”

	Visit	Visit-to-Shop	Shop-to-Buy
Front Subzones	19.6%	53.1%	20.3%
Middle Subzones	14.3%	72.2%	25.6%
Back Subzones	16.7%	62.4%	18.8%

If we consider all visitors alike, then the middle to back subzones are better at “converting” them from visiting to shopping. This pattern for the first conversion seems quite consistent, and therefore largely driven by location. But the second conversion, from shopping to buying, does not seem to follow any type of consistent pattern (or a weak pattern at best). This indicates that the actual purchase is driven by the product, not its location. This is the factor that prevents us from arbitrarily causing sales by simply placing an item here or there. For the final purchase, the product must speak for itself, and not rely on its location.

The VitalQuadrant™ analysis of the DoubleConversion™ process suggest opportunities for merchandising and sales enhancements.

* **Order-of-10™** identifies the point in the shopping trip in which the purchase is made. Each trip is divided into 10 segments by length (deciles), and the segment (of the 10) in which the purchase is made is noted. All purchases for a section are then averaged to yield a number that reflects at what point in the shopping trip the purchase typically occurs.

DoubleConversion™
Vital Quadrant™ Analysis

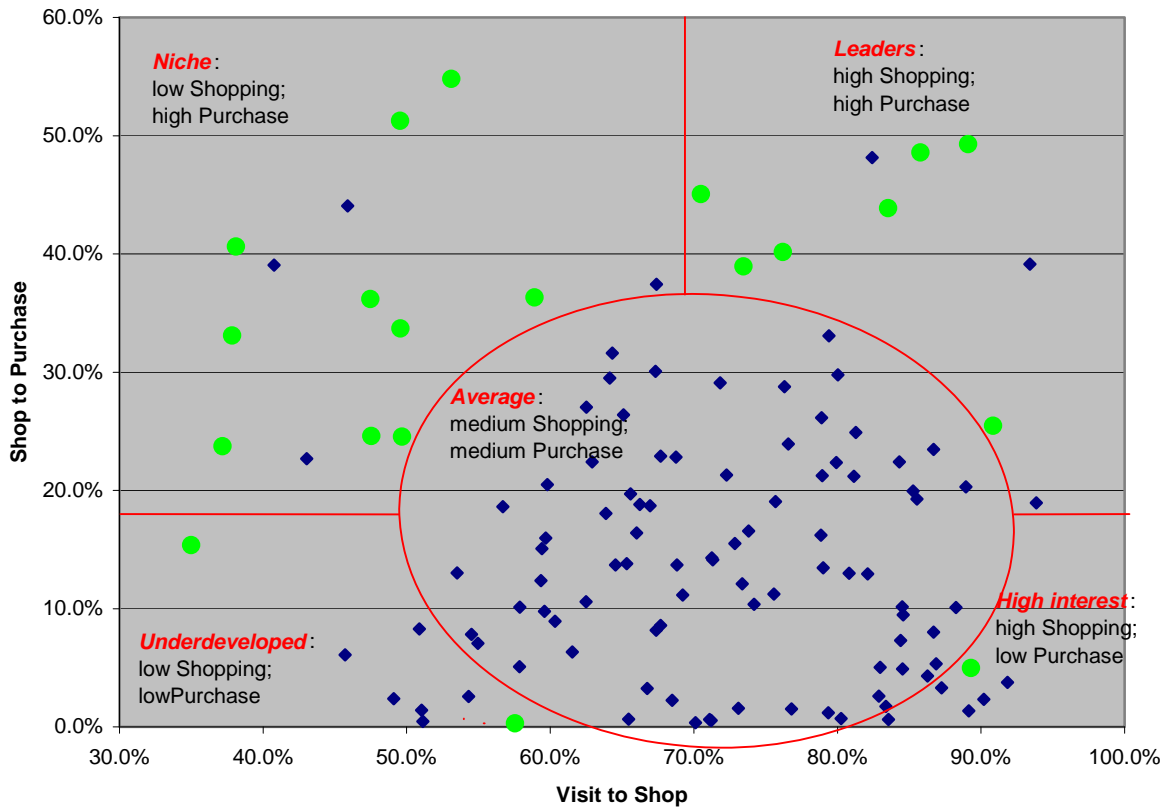


Figure 4. DoubleConversion™ refers to the conversion of a visitor (passerby) to a shopper; and then conversion of a shopper to a buyer.

Although this represents all of the subzones in the store for which we have adequate conversion data, it helps in understanding the various center-of-store categories under consideration. The VitalQuadrant™ categories for the center of the store are highlighted as bright green in this chart. These “vital few” are detailed here:

		BEHAVIOR			DoubleConversion™				
		VISIT OR PASS	PAUSE OR SHOP	PURCHASES	VISIT TO SHOP	SHOP TO PURCH			
		EffctDst™		percent			Vital-Quadrant™		
ALL SHOPPERS >>		100.0%	100.0%	100.0%	100.0%	100.0%			
Z	Zone	SubSubZone	N =	57,262	57,262	199,258			
17	SodaSaltySnacks	100	(W) Chips/Snacks/(E) Soft Drinks	15.5%	13.3%	6.5%	85.8%	48.6%	Leader
17	SodaSaltySnacks	99	(W) Chips/(E) Barbeque Supplies	15.1%	11.1%	4.3%	73.5%	38.9%	Leader
18	CerealJuice	93	(W) Bottled Juice/(E) Cold Cereal	14.0%	10.7%	4.3%	76.2%	40.1%	Leader
25	MexEthPastaBeans	56	(W) Pasta Sauces/(E) Canned Beans	8.3%	5.8%	2.6%	70.5%	45.1%	Leader
25	MexEthPastaBeans	55	(W) Dried Pasta/(E) Mexican Salsa & Beans	8.0%	6.7%	2.9%	83.5%	43.9%	Leader
27	BreadCookiesCrack	34	(W) Crackers & Cookies/(E) Bread	23.1%	20.6%	10.1%	89.1%	49.3%	Leader
27	BreadCookiesCrack	35	(W) Crackers (E) Bread	24.5%	22.3%	5.7%	90.8%	25.5%	Leader
24	HealthBeautyPaper	62	(W) Tissues/(E) Shaving, Skin Care	20.4%	18.2%	0.9%	89.3%	5.0%	High Interest
16	DressingsPickles	103	Steak/BBQ Sauce, Catsup, Olives, Peppers	9.5%	5.6%	2.0%	58.9%	36.3%	Niche
16	DressingsPickles	104	Salad Dressings, Mayonnaise, Mustard	7.8%	4.2%	2.3%	53.1%	54.8%	Niche
16	DressingsPickles	105	Salad Amendments, Vinegar	9.6%	4.6%	1.7%	47.5%	36.2%	Niche
21	IceCreamCoffeeCandy	80	(W) Candy/(E) FF - Ice Cream Snacks/Bars	19.5%	9.7%	3.3%	49.6%	33.7%	Niche
22	LaundryCleanerAuto	70	(W) Hand/Body Soaps/(E) Scrub, Cleaners & Toilet	11.8%	5.6%	1.4%	47.5%	24.6%	Niche
22	LaundryCleanerAuto	71	(W) Mops, Brushes/(E) Liquid Clnrs, Disinfectants	8.1%	3.0%	0.7%	37.2%	23.7%	Niche
22	LaundryCleanerAuto	75	(W) Liquid Bleach/(E) Hardware, Car Care	8.9%	4.4%	1.1%	49.7%	24.5%	Niche
25	MexEthPastaBeans	58	(W) Canned Seafood/(E) Oriental Specialties	17.3%	6.6%	2.7%	38.1%	40.6%	Niche
25	MexEthPastaBeans	57	(W) Spice Mixes/(E) Dried Beans, Rice & Mixes	9.6%	4.7%	2.4%	49.5%	51.3%	Niche
26	CannedDried	49	(W) Canned Veges/(E) Canned Beans/Chili/Pasta	27.9%	10.6%	3.5%	37.9%	33.1%	Niche
16	DressingsPickles	102	Pickles	14.3%	5.0%	0.8%	35.0%	15.4%	Under-developed
25	MexEthPastaBeans	53	(E) Mexican Specialties	21.2%	11.5%	0.3%	54.3%	2.6%	Under-developed

None of the merchandising *leaders* (high DoubleConversions™) are found on end-of-the-aisle displays. These leaders may or may not get a lot of traffic, but they stop the traffic they get, and complete the sale with a high degree of frequency. Thus, even though dried pasta and pasta sauces are not generating huge sales, they are very effectively selling the traffic that comes by them. Swapping these leaders with the underdeveloped category at the back of the same aisle would likely improve sales of both categories.

It is less clear what improvements to make with leaders than what to do with *underdeveloped* products that are in premium locations. Thus, pickles on a high traffic corner were clearly not effectively using the traffic and exposure they were getting. They have already been reset to make way for more attractive salty snacks.

As noted in the EyeShare™ (“GRP”) discussion, the Mexican specialties in subzone 53 are failing to take advantage of their exposure, and as recommended above, could be swapped with the pasta and sauces that are just down the aisle.

The tissues and shaving materials in subzone 62 are stopping a lot of the shoppers who come by, but the conversion into sales is exceptionally low. These are identified as *high interest* products. Without asking shoppers why they are stopping but then moving on without a purchase, it is unclear what should be done with this single location (that is just outside the “average” ellipse, in any case).

There are a much larger number of *niche* products, often near the end of an aisle. Three of these are in the Dressings and Pickles zone, which was swapped aisle for aisle with the Salty Snacks.

All of the Laundry/Auto products have long enough purchase cycle that it is not unexpected that substantial numbers of shoppers would pass them without buying. And if they did stop it would

be with a high likelihood of completing a purchase. The canned chili and pasta items occupy a visually advantageous space that might be more effectively used by another category.

The candy and ice cream novelties would make a valuable addition to the C-store format near the entrance. However, this would require the addition of freezer capacity in that location, and probably some low vertical or slant displays typical of C-stores for the candy portion. This will be discussed further in the C-store section of the report.

Eye on profits – Relocating “Underdeveloped” Categories

Again, our goal is a few percentage points increase in sales, which can more than double profits. Each reset that puts better selling products in a high exposure, high traffic location, in place of a poorer selling product, is likely to advance toward this goal. Replacing the two “underdeveloped” categories identified here should make a significant advance toward the goal.

For each subzone in the grocery section, the average height of products sold is about 38 to 42 inches. Some of the subzones that deviate from this “norm” raise the question of whether they should be moved up or down to be nearer the average. As already noted, this average is significantly lower than eye level for most shoppers. The reasonable presumption is that eye level is *not* ideal. If it were, there should be a trend to find more sales near eye level, which there is not.

The following sections are ones in which the average sales are about a foot above or below the typical value:

Z	Zone	Sub	SubZone	N =	PURCHASE HEIGHT					
					AVERAGE ELEVATION			AVERAGE ELEVATION		
					side	all; N or W	std dev	side	S or E	std dev
					1,265,823					

21	IceCreamCoffeeCandy	78	(W) Hot Chocolate, Teas	W	1.23	0.42				
20	FrozenFood	85	(E) Frozen Foods, juice, breakfast				E	1.78	1.28	
25	MexEthPastBeans	58	(W) Canned Seafood	W	1.93	1.48				
23	BakingSpiceHouse	65	(E) Housewares				E	2.19	1.42	
20	FrozenFood	82	(E) Frozen Foods, pizza, pockets				E	2.29	0.45	
24	HealthBeautyPaper	63	(W) Paper Towels/(E) Hair Care	W	2.30	1.27				
16	DressingsPickles	105	Salad Amendments, Vinegar	W	2.32	1.65				
17	SodaSaltySnacks	97	(W) Chips	W	2.62	2.23				

17	SodaSaltySnacks	97	(E) Napkins, Plastic Tableware				E	4.15	1.72	
18	CerealJuices	93	(W) Bottled Juice	W	4.18	1.51				
20	FrozenFood	81	(E) Frozen Foods, pizza, pockets				E	4.20	1.10	
20	FrozenFood	82	(W) Frozen Foods, dinners, entrees	W	4.31	1.46				
17	SodaSaltySnacks	99	(E) Barbeque Supplies				E	4.31	1.51	
17	SodaSaltySnacks	100	(E) Soft Drinks				E	4.82	1.35	

Unless there are specific studies indicating otherwise, it would seem advisable to adjust all of these displays to bring the average elevations closer to the 38 to 42 inch norms for the rest of the store. For example, do heavy 2 liter soft drink bottles really sell better when they are 18 inches above the “normal” shopping level? Admittedly the 12 packs of cans below them are heavier. But possibly the cans (which have a lower sales volume) should be lowered by stretching them for a greater distance along the bottom shelf, allowing the 2 liter bottles to be lowered, and with

other, lighter, slower selling merchandise moved to the top shelf. Moving the fast moving cups in subzone 99 to a lower elevation would make shopping for them easier and would likely improve sales. Cutlery and other disposable dinner ware could be relocated to the higher shelves, even though this isn't typical of displays of these items. Trading a portion of the tea items to the bottom shelf in subzone 78 to allow the faster moving hot chocolate to move up could also be helpful.

Eye on profits – Raise and Lower Merchandise to Match Shoppers Posture/View

A few percentage points increase in sales can more than double profits. Each reset that puts better selling products in a high exposure, high traffic location, in place of a poorer selling product, is likely to advance toward this goal. For example, hot chocolate mixes should be raised to a higher shelf, regardless of pack size, by trading with tea; and 2 liter softdrinks should be lowered by trading with drink mixes or other nearby products.

The type of trip that shoppers are on gives insight into their thinking and motivation as they are addressing each section. The table below shows, for the shoppers in each zone, what percentage of them were on each of the four TripType: Length™ trips. That is, were they on a Quick trip, a Fill-in, a Routine or Stock-Up type of trip. But we also know the pattern of how shoppers *in that zone* are passing through the store. This is the TripType: Pattern™, which is designated as Racetrack, one of the three aisle patterns(Zigzag, Excursion or Traverse), Destination, C-Store or Wander.

		TripTypes: Length™				TripTypes: Pattern™						
		QUICK	FILL-IN	ROUT-INE	STOCK-UP	RACE-TRACK	ZIGZAG	EXCUR-SION	TRA-VERSE	DESTIN-ATION	"C-STORE"	WANDR (other)
		<2 minutes	2-10 min	10-20 min	20+ min	total	total	total	total	total	total	total
		11.9%	36.2%	29.4%	22.5%	36.1%	5.3%	7.8%	5.8%	2.5%	19.9%	22.7%
Z Zone		6,818	20,741	16,847	12,856	20,654	3,470	4,591	4,891	1,415	11,394	13,765
16	DressingsPickles	0.0%	20.0%	41.1%	38.9%	55.8%	9.9%	13.0%	9.1%	0.1%	4.4%	7.8%
17	SodaSaltySnacks	0.0%	21.3%	41.3%	37.3%	52.8%	13.0%	14.2%	9.1%	0.0%	4.4%	6.4%
18	CerealJuices	0.0%	21.2%	39.6%	39.2%	51.5%	14.1%	14.8%	9.8%	0.0%	4.2%	5.6%
19	BabyPets	0.0%	22.2%	39.3%	38.5%	51.0%	13.7%	15.6%	10.6%	0.1%	4.5%	4.5%
20	FrozenFood	0.0%	19.8%	40.1%	40.1%	49.2%	14.0%	15.5%	11.2%	0.0%	4.3%	5.8%
21	IceCrmCoffCand	0.1%	21.4%	39.6%	38.9%	49.1%	14.0%	15.6%	11.1%	0.0%	4.6%	5.6%
22	LndryCleanAuto	0.2%	17.5%	36.6%	45.6%	48.1%	16.1%	16.2%	11.5%	0.0%	4.2%	3.8%
23	BakingSpiceHous	0.3%	21.5%	39.3%	38.9%	48.4%	14.6%	16.2%	11.3%	0.0%	4.5%	4.9%
24	HealthBtyPaper	0.3%	22.5%	39.8%	37.3%	48.8%	13.5%	16.5%	11.2%	0.1%	5.0%	4.8%
25	MexEthPasta	0.4%	21.0%	39.7%	38.9%	47.8%	13.8%	16.6%	10.3%	0.1%	5.6%	5.9%
26	CannedDried	1.2%	25.7%	37.2%	35.9%	47.8%	13.7%	15.3%	9.4%	0.3%	6.9%	6.6%
27	BrdCkieCrckrsPB	0.6%	25.4%	38.9%	35.2%	48.9%	13.2%	14.6%	9.0%	0.2%	7.1%	7.0%
	Center-of-Store Aisles											
	Front Subzones	0.3%	22.0%	38.7%	38.9%	50.5%	14.4%	14.9%	16.5%	0.2%	5.6%	5.8%
	Middle Subzones	0.1%	18.7%	38.6%	42.6%	49.3%	16.0%	15.5%	17.5%	0.1%	4.8%	5.2%
	Back Subzones	0.0%	18.6%	39.5%	41.9%	50.2%	15.5%	15.0%	17.1%	0.0%	4.5%	5.6%

In the center-of-store aisles there is almost no quick trip or destination shopping. The typical figure is at or near 0%, down from the nearly 12% quick trip for the store as a whole. What there is, occurs mostly at the front of aisle 11 where the canned and heat-and-serve chili, beans and pasta face the C-store section. Some portion of this might be incorporated in the C-store section, particularly if there is an expansion of foodservice, with the addition of a consumer-use microwave.

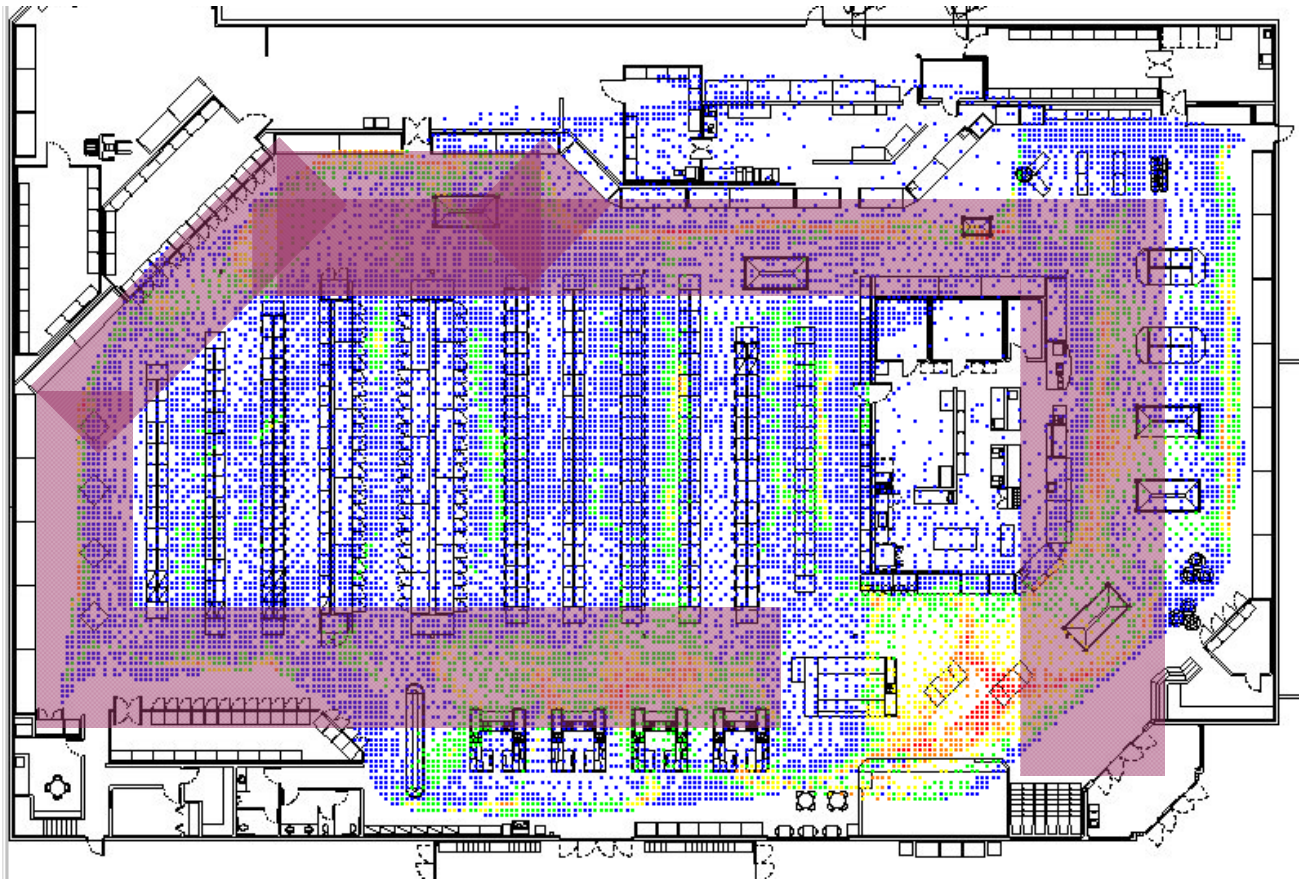
For most of the aisles, there is a 20, 40, 40 distribution among fill-in, routine and stock-up trips. The notable exceptions to this include aisle 7 (laundry and cleaning supplies) where nearly half are on stock-up trips. This type of behavior is also confirmed by the highest percentage of zigzag trips in the store: 16%, three times the average amount for the store. Aisles 4, 9, 11 and 12 (zones 19, 24, 26 and 27) have extra increments of fill-in trips. This is primarily due to increased shopping in the first subzones of these aisles: canned cat food, OTC medications, heat-and-serve chili+ and nutrition/breakfast bars.

Since this is the area of the store where most of the “aisles” are (there are a few short ones in produce), it is not surprising that about 40% of these trips consist of one of the aisle type behaviors: zigzag, excursion or traverse (about 10% is C-store or wander). The other “half” of the trip consists of RaceTrack type shopping.

The large amount of excursion shopping is revealed not only in this pattern analysis, but by the percentage of shoppers who visit end subzones compared to middle subzones.

Area Analysis – Racetrack

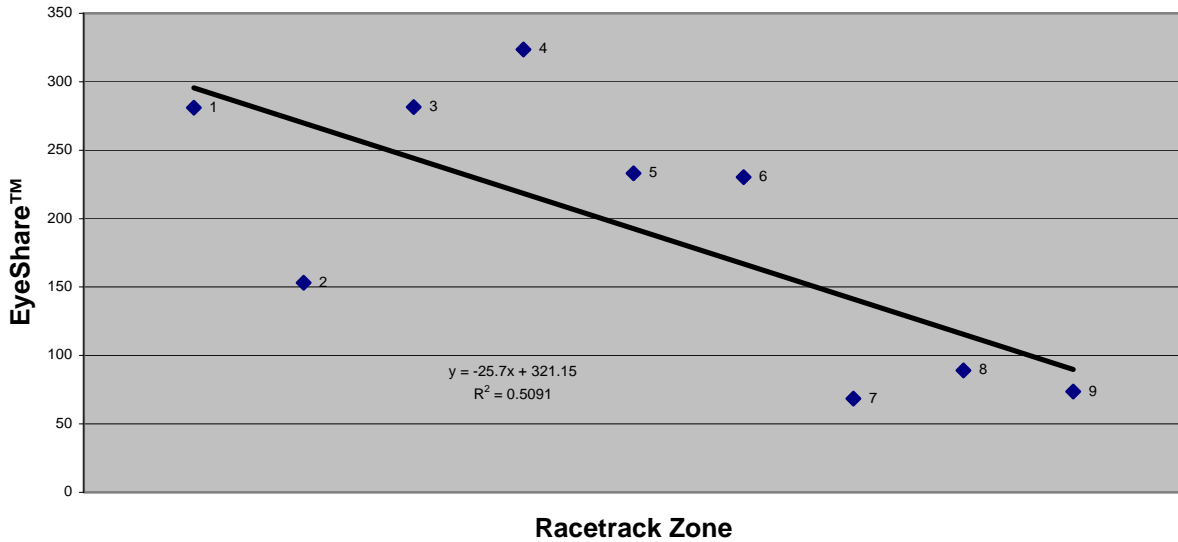
The racetrack begins at the store entrance, proceeds straight south to the main aisle across the back of the store, and then continues counter-clockwise along the perimeter of the shopping area to the front of the store, and then across the front of the store between the checkstands and the front end-cap, ending at checkstand 8:



Two factors make the analysis of the racetrack especially difficult: many of the products do not have standard UPC numbers but rely on price look-ups (PLU's) or custom codes assigned by the store; sets are changed frequently, particularly for end-caps, but also for many other free-standing displays. Although PathTracker™ will in the future readily accommodate display changes, the inaugural study focused only on the movement of shoppers around the store, not the movement of displays and products. The problem of non-standard product codes has been resolved to the extent of including all sales for single items that occur with a minimum of, on average, one sale per day. However, for some high value items (such as meats and other random weights, e.g.) there can still be some lapses in the data (and consequently, the analysis.) Given these considerations, there is still a lot of learning available for the racetrack (and for the “produce” and C-store sections.)

The racetrack is characterized by tremendous variety, and lots of EyeShare™ (“GRP”). But there is a somewhat regular decrease in EyeShare™ (“GRP”) as the shopper proceeds around the racetrack:

EyeShare™ on the Racetrack



Graph	Zone	Description	EyeShare™ ("GRP")
1	4	Deli	281
2	8	SeafoodBBQchicken	153
3	9	Meat	281
4	10	CheeseYogurt	324
5	11	Dairy	233
6	12	ColdBeverages	230
7	13	ColdBeer	68
8	14	GreetingCards	89
9	15	Checkout	74
	29	RearEndCaps	79
	28	FrontEndCaps	233

The endcaps are not plotted because in both cases they extend over a large portion of the track, and neither series fits into the trend of decreasing EyeShare™ (“GRP”) as progress is made around the track. For the rear end-caps, it is apparent from the shopper density map that most shoppers are traveling right along the perimeter, and thus are across a wide aisle from the rear end-caps, and are not seeing the end-caps, to a large extent. On the other hand, the front end-caps are repeatedly seen as shoppers move up and down the front aisle, as well as serving as access points for the center-of-store shopping.

The seafood EyeShare™ (“GRP”) is depressed because the seafood counter is screened from the majority of traffic by the BBQ chicken display. The cheese/yogurt area gets an unusual amount of EyeShare™ (“GRP”) because shoppers tend to linger in this area.

Another way to look at EyeShare™ (“GRP”) is to compare it to sales, on the basis that increasing exposure should result in increasing sales. A VitalQuadrant™ analysis shows that a high percentage of zones outside the “norm” or average fall on the racetrack.

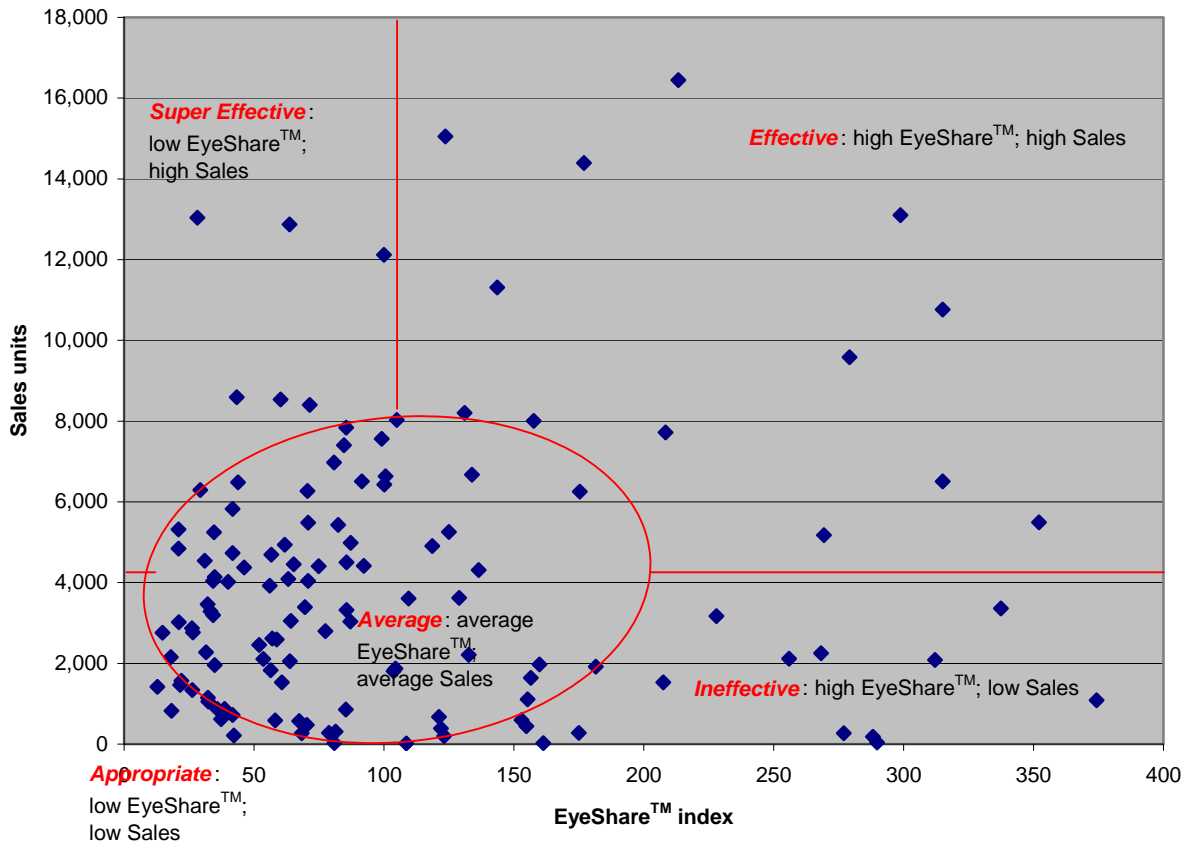
Three of the eight “supereffective” subzones (lots of sales without much exposure) occur on the racetrack. These are the two subzones in the northeast corner of the store: beer and one of the chilled soft drink displays. The other is meats and cheeses in subzone 155 at the rear of the store.

Ten of nineteen “ineffective” subzones (lots of exposure, less sales) are on the racetrack. Only three of the twenty-one “effective” subzones (high exposure, high sales) are on the racetrack.

Two of the six low exposure, low sales, “appropriate” subzones are on the racetrack. These are considered appropriate because low sales probably deserve low exposure.

EyeShare™ vs. Sales

Vital Quadrant™ Analysis



These observations suggest that there are quite a number of areas on the racetrack that are not making effective use of the exposure they are getting.

Z	Zone	Sub	SubZone	EyeShare™ ("GRP")	VitalQuadrant™
4	Deli	112	Deli Meats	268	Ineffective
4	Deli	145	Gourmet Cheese (W)	161	Ineffective
4	Deli	146	Gourmet Cheese (E)	277	Ineffective
9	Meat	150	Meat 150	337	Ineffective
9	Meat	151	Meat 151	374	Ineffective
9	Meat	152	Meat 152	256	Ineffective
12	ColdBeverages	107	Soft Drinks RT 107	290	Ineffective
12	ColdBeverages	19	(N) Ice - Fishing Bait/Cold Beverages	228	Ineffective
29	RearEndCaps	46	2-3 End Aisle-S, Franz pastries	109	Ineffective
28	FrontEndCaps	24	5-6 End Aisle Freezer-N, varies (pizza)	175	Ineffective

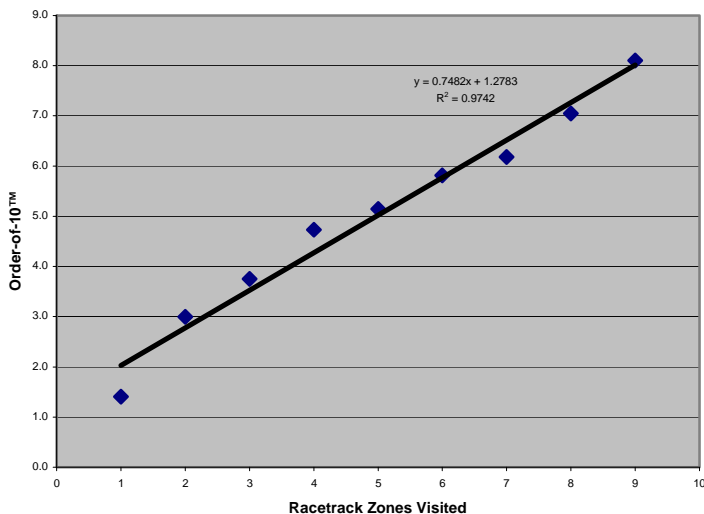
Near the end of the test period the gourmet cheese displays (145,146) were reset, so this display may already be moved to the average category, or an effective quadrant. The meat sections may be underreporting sales because of the high value PLU problem mentioned above.

The very high exposure of the service deli meat display suggests that this counter is not delivering sales in proportion to the opportunity represented. However, the PLU problem may be masking the reality at this prime location.

For the subzones cited, closer management attention may be warranted.

RACETRACK		ORDER OF VISIT	VISIT OR PASS	Order-of-10™	VISIT TO PURCH	Buy-Left™	Buy-Right™	Buy-Speed™
Z	Zone							
4	Deli	1	91.6%	1.4	6.9%			96
8	SeafoodBBQchicken	2	48.8%	3.0	3.4%			55
9	Meat	3	56.1%	3.8	17.8%	28.2%	71.8%	37
10	CheeseYogurt	4	51.8%	4.7	29.9%	30.9%	69.1%	43
11	Dairy	5	44.8%	5.1	53.4%	32.5%	67.5%	36
12	ColdBeverages	6	32.9%	5.8	45.8%	51.6%	48.4%	31
13	ColdBeer	7	24.0%	6.2	41.7%	41.3%	58.7%	16
14	GreetingCards	8	19.5%	7.1	4.2%			108
15	Checkout	9	100.0%	8.1	13.1%			42
29	RearEndCaps	-	59.1%	4.5	3.3%			11
28	FrontEndCaps	-	70.3%	6.9	4.0%			28

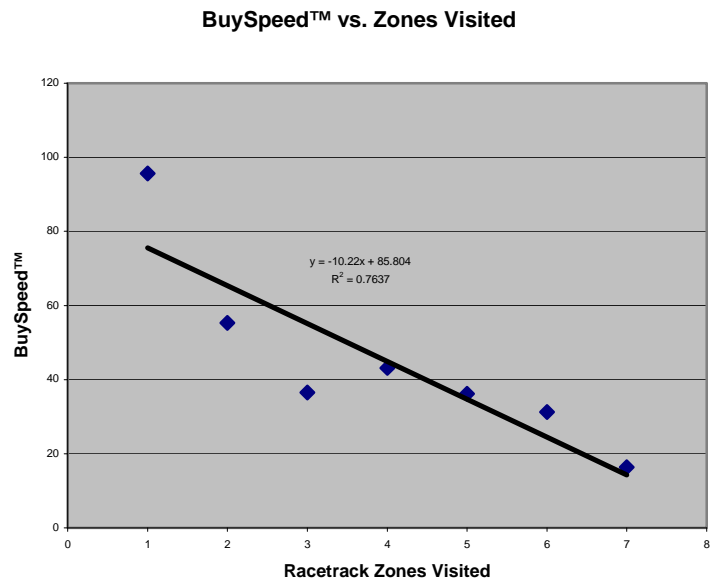
Order-of-10™ Purchases vs. Zones Visited



The Order-of-10™ purchasing correlates nearly perfectly with the order in which the zones are visited. This confirms the steady progression around the racetrack. It also shows why questions such as, “does the purchase of item A lead to the purchase of item B?” are moot.

The order of purchasing A and B is directly related to the order in which they occur in the shopping trip (location), and is unrelated to the products involved.

As the shopper proceeds around the racetrack, the speed of shopping increases. In the center-of-store aisles, long shopping times (high BuySpeed™ seconds) led to significantly higher levels of purchasing. If any approximation of the principle applies on the racetrack, we should expect substantial



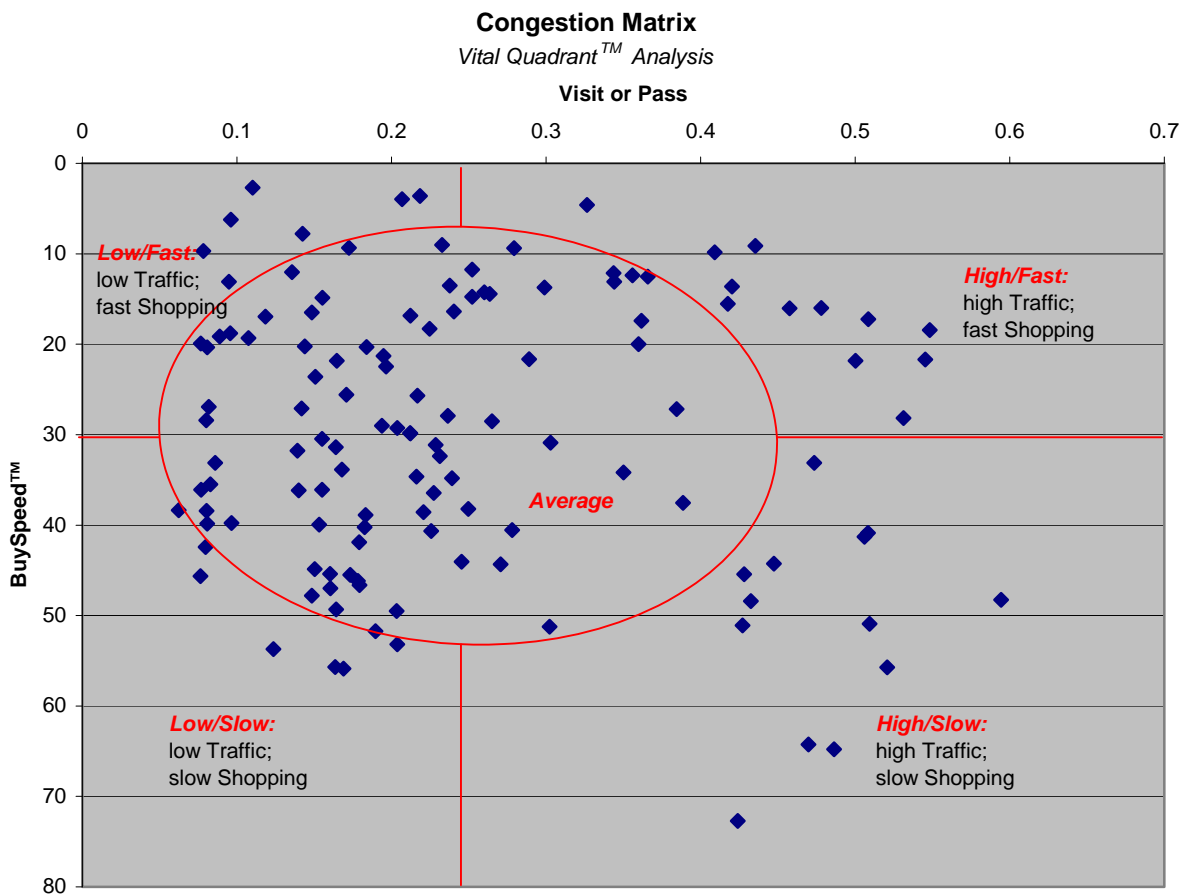
purchases near the beginning of the track where there is large visual impact (EyeShare™ (“GRP”)), long times for purchasing (BuySpeed™) and lots of traffic (EffectiveDistribution™, or visits). In fact, the highest conversion rates (DoubleConversion™) occur near the end of the track where the store leaders of Dairy, Cold Beverages and Cold Beer are located. Low conversions, particularly of the free-standing deli case at the entrance (subzone 115) and of the BBQ and fish displays (162 and 147), as well as the ineffective deli meat display case at the front corner of the deli/bakery all represent opportunities for improved merchandising.

Eye on profits – BBQ Chicken and Foodservice

Since our goal is a few percentage points increase in sales, improvements in merchandising of these three subzones could contribute significantly to the goal: deli case at the entrance (115); sliced meat service deli display (112) and BBQ chicken (162). Simply moving the BBQ chicken

fixture to the entrance (trading with the deli case-115?) might be an improvement. And would enhance the foodservice options of the C-store area (discussed under that section.)

There is another important application of BuySpeed™ which is related to the degree of congestion that may occur in a given area. For example, consider the VitalQuadrant™ analysis of BuySpeed™ and EffectiveDistribution™ (the percentage of shoppers visiting a subzone.)



This analysis shows us the “vital few” subzones that have the best potential for making merchandising improvements. We are least concerned with the High/Fast quadrant, since these items are taking a short time for shoppers to select, and are being exposed to a relatively large

number of shoppers. If there is congestion, at least there will be a lot of product movement. The Low/Slow quadrant is also of little interest because it is appropriate to have products that require a lot of time for selection in an area with low traffic. What is of concern are products that take a long time to buy (high BuySpeed™) but are in a high traffic area. These might be more effectively traded with items that are purchased quickly (low BuySpeed™) but are getting little traffic. Or, alternatively, look for ways to provide a less congested location for these types of purchases:

Z	Zone	Sub	SubZone	VISIT OR PASS	BuySpeed	VitalQuadrant
				<i>high/low</i>	<i>fast/slow</i>	
30	Chinese	15	Chinese Restaurant	40.0%	227	High/Slow
5	Produce	119	(E) Fruit - 2	35.9%	149	High/Slow
8	SeafoodBBQchicken	162	BBQ Chicken	47.8%	149	High/Slow
4	Deli	116	(N) Deli - Pasta Premade, Hot Case, Register	47.5%	138	High/Slow
30	Chinese	109	Service Desk North	40.3%	137	High/Slow
2	Bakery	113	Baking Tables With Breads, Donuts, Cakes, Etc.	61.8%	113	High/Slow
4	Deli	145	Gourmet Cheese (W)	39.9%	93	High/Slow
1	Entrance	48	Entrance and carts	81.7%	79	High/Slow
7	Wine	143	Wine	42.4%	73	High/Slow
4	Deli	117	(S) Deli - Coke Machine, Cold Drinks	48.6%	65	High/Slow
10	CheeseYogurt	158	Jello/Lunch Meats	47.0%	64	High/Slow
4	Deli	112	Deli Meats	52.1%	56	High/Slow
10	CheeseYogurt	159	Yogurt	42.7%	51	High/Slow
9	Meat	152	Meat 152	50.9%	51	High/Slow
9	Meat	150	Meat 150	43.2%	48	High/Slow
15	Checkout	31	Service Desk	59.4%	48	High/Slow
11	Dairy	161	Milk	42.8%	45	High/Slow
10	CheeseYogurt	156	Cheese	44.8%	44	High/Slow
28	FrontEndCaps	24	5-6 End Aisle Freezer-N, varies (pizza)	50.6%	41	High/Slow
9	Meat	154	Deli Meat/Sausage/Bacon	50.8%	41	High/Slow
9	Meat	151	Meat 151	47.3%	33	High/Slow
16	DressingsPickles	103	Steak/BBQ Sauce, Catsup, Olives, Peppers	9.5%	13	Low/Fast
16	DressingsPickles	104	Salad Dressings, Mayonnaise, Mustard	7.8%	10	Low/Fast
16	DressingsPickles	102	Pickles	14.3%	8	Low/Fast
16	DressingsPickles	105	Salad Amendments, Vinegar	9.6%	6	Low/Fast
29	RearEndCaps	38	10-11 End Aisle-S, varies	20.7%	4	Low/Fast
12	ColdBeverages	107	Soft Drinks RT 107	21.8%	4	Low/Fast
5	Produce	129	(S) Fruit - 4	11.0%	3	Low/Fast

The great majority of the High/Slow subzones are on the racetrack. Particularly of interest are the subzones 150 through 159 which span from fresh meats to yogurt. Since these items are not amenable to relocation with the existing configuration of refrigerated displays, the slow buying might be of greatest interest in terms of improving on store design, not simply resetting the merchandise.

Eye on Profits – Reduce Congestion

Seeking incremental sales by making it easier for shoppers to increase their sales makes sense.

One way to do this is to recognize that although “shoppers like to go where shoppers are,” often one or two shoppers in a location can impede shopping by additional shoppers. For example, if one or two shoppers are pondering over their selections from the multitude of yogurt options, their hovering can be a deterrent to additional shoppers approaching the case. Secondary placement of a limited selection of yogurt (in the C-store section) might be beneficial.

The types of trips shoppers are on when they visit the various zones give some indication of the thinking and motivations of those shoppers:

Z Zone		TripTypes: Length™				TripTypes: Pattern™						
		QUICK	FILL-IN	ROUT- INE	STOCK- UP	RACE- TRACK	ZIG- ZAG	EXCUR- SION	TRA- VERSE	DESTIN- ATION	C- STORE	WAND (other)
		<2 minutes	2-10 min	10-20 min	20+ min	total	total	total	total	total	total	total
		11.9%	36.2%	29.4%	22.5%	46.8%	7.8%	10.9%	7.6%	2.0%	15.3%	9.6%
4 Deli	1	10.2%	35.2%	30.8%	23.7%	50.4%	7.3%	11.4%	9.4%	0.9%	11.1%	9.6%
8 SeafdBBQchkn	2	0.0%	25.9%	43.5%	30.5%	54.3%	8.3%	13.0%	11.2%	0.1%	3.8%	9.3%
9 Meat	3	0.0%	28.4%	42.5%	29.1%	53.9%	9.2%	12.9%	10.7%	0.0%	4.4%	8.9%
10 CheeseYogurt	4	0.0%	27.0%	43.0%	30.0%	53.2%	10.3%	13.1%	9.9%	0.0%	4.5%	9.0%
11 Dairy	5	0.0%	24.7%	43.4%	32.0%	54.0%	10.4%	13.0%	9.5%	0.0%	4.3%	8.7%
12 ColdBeverages	6	0.0%	22.4%	42.5%	35.1%	56.2%	9.6%	12.8%	8.8%	0.1%	4.4%	8.0%
13 ColdBeer	7	0.1%	26.8%	40.8%	32.3%	55.0%	9.7%	13.1%	8.8%	0.3%	5.0%	8.1%
14 GreetingCards	8	0.3%	28.5%	40.2%	31.0%	52.7%	9.5%	12.5%	8.9%	0.5%	5.0%	10.8%
15 Checkout	9	11.9%	36.2%	29.4%	22.5%	46.8%	7.8%	10.9%	7.6%	2.0%	15.3%	9.6%
29 RearEndCaps	-	0.0%	30.0%	41.6%	28.4%	51.8%	11.9%	14.0%	10.2%	0.0%	4.6%	7.5%
28 FrontEndCaps	-	2.3%	35.7%	36.7%	25.3%	53.1%	9.8%	13.1%	9.0%	0.7%	6.6%	7.6%

The relatively high percentages of “Quick trippers” in the Deli and checkout zones of the racetrack simply illustrate overlap of these TripTypes™ at these points. However, it is possible that the two deli subzones that do not perform well as a part of the racetrack (112 and 115) should be restructured to integrate into the C-store format. This is particularly true of the free-standing deli case at the entrance.

All aisle traffic (zigzag, excursion and traverse) are relatively high for the racetrack shoppers. This is a consequence of the absence of Quick trip, C-store shoppers and the increased amount of routine and stock-up shopping. This emphasizes the isolation of C-store shopping from racetrack and center-of-store aisle shopping. A single merchandising strategy is not appropriate for these fundamentally different shoppers.

The large amount of purchases being made on the right side of shoppers (BuyRight™) around the racetrack (counter to their usual aisle shopping) suggests that merchandising displays in the middle of the racetrack (between the perimeter wall and the rear end-caps, for example) could be particularly effective.

Eye on Profits – Racetrack Mid-Aisle Strategy

The center of the racetrack aisle is prime merchandising space that presents extra opportunities for profit. Since about half the shoppers in the store make use of the racetrack, selection of merchandise, particularly at the beginning of the track, should be done with the most stringent standards for sales and profits. If the dominant “shop-left” tendency of the symmetrical center-of-store aisles is any indication, a low, broken wall of merchandise 6 – 10 feet from the perimeter wall might be very effective for merchandising.

Area Analysis – Produce, Floral and Wine

These three zones lie to the right of the racetrack at the beginning of the racetrack. Although there is some aisle structure in the produce department itself, none of these areas lend themselves to the type of shopping common to the rest of the store. One distinction is the high EyeShare™ (“GRP”) of the majority of the subzones. EyeShare™ (“GRP”) is typically 50% higher than the store average, with wine getting three times the visual impact of the average area in the store. Based on the VitalQuadrant™ analysis, there are five subzones that are ineffective in their use of the visual exposure they are getting: floral (142) and four produce end-tables (118, 119, 120 and 131). Two caveats are necessary: produce and floral items and their displays are nowhere near static. This means that records of actual sales from these subzones may be inaccurate because weekly records of items on display are not available. Secondly, the high EyeShare™ (“GRP”) creates a high expectation of sales, particularly for subzones 118, 119 and 120 that immediately bound the highest traffic portion of the racetrack.

These areas of the store are very important because they are visited and shopped by half the people who visit the store. And half of those who pass, pause or shop the produce section actually purchase something. Only floral and organic produce have insufficient sales, and are thus classed as underdeveloped. Again, the difficulty of attributing sales to the floral zone, based on scanner data, may account for this deficiency. In any event, the attractive appearance of floral at the entrance must partially account for the *Oregonian*'s editorial description of this store as “the classy new Troutdale Thriftway.” The wine section completes the second conversion (DoubleConversion™) at a high enough rate (10%) to achieve at least “average” status. The average Order-of-10™ scores move progressively from 0.4 for flowers to 2.3 for wine. Thus,

typically one fourth of the shopping trip is complete by the time the wine selection (if any) has been made.

The speed of making purchases (BuySpeed™) varies from a low of 16 seconds for the floral area to 73 seconds for wine; with an average of 27 seconds for produce, when the outlier at subzone 119 is excluded. This outlier illustrates a problem that may impact produce more than other areas of the store: PathTracker™ monitors shopping carts (and baskets), and not the shopper directly. This means that if the cart is parked, time is being allocated to shopping/purchasing in the immediate subzone. However, it is likely, particularly in produce, that shoppers leave their carts and move around to nearby subzones as they shop. Given that we are tracking more than a million purchases, this problem should be averaged out across subzones, except in special cases. Subzone 119 is a special case because it is right across the main racetrack aisle from the cash register for the service deli/service bakery. This is a logical place for shoppers to park their carts while they are waiting and paying for their service orders.

Since the entry is contiguous or part of each of the major shopping areas except for the center-of-store aisles, it is not surprising to find two candidates in this general area for inclusion in the C-store area. These two are the floral (142) which includes 5% of its traffic as quick trippers; and the deli cold case (115) which has 10% of its traffic as quick trippers. The deli case (112) also has about 5% of this type of shopper. For the produce section, there is almost no quick trip traffic. The highest is the end of the first table, 118, which is still well below 1% of this traffic.

Three fourths of produce shopping is done on routine or stock-up trips. This further confirms the lack of marketing of produce to the quick trip shoppers, even though they are very near the section.

			TripTypes: Length™				TripTypes: Pattern™							
			QUICK	FILL-IN	ROU-TINE	STCK-UP	RACE-TRCK	ZIG-ZAG	EXCUR-SION	TRA-VERS	DESTIN-ATION	C-STOR	WNDR (other)	
			<2 minute	2-10 min	10-20 min	20+ min	total	total	total	total	total	total	total	
ALL >>			11.9%	36.2%	29.4%	22.5%	46.8%	7.8%	10.9%	7.6%	2.0%	15.3%	9.6%	
Z Zone	Sub	SubZone	6,818	20,741	16,847	12,856	20,654	3,470	4,591	4,891	1,415	11,394	13,765	
3	Floral	0	5.3%	30.1%	33.9%	30.7%	46.5%	6.5%	10.3%	8.2%	1.5%	16.1%	10.8%	
3	Floral	142	Flowers	5.3%	30.1%	33.9%	30.7%	46.5%	6.5%	10.3%	8.2%	1.5%	16.1%	10.8%
5	Produce	0	0.3%	26.5%	42.1%	31.1%	52.0%	8.4%	13.2%	11.0%	0.1%	4.1%	11.3%	
5	Produce	134	Vegetables	0.1%	18.6%	39.0%	42.2%	49.2%	8.2%	13.1%	10.8%	0.1%	4.9%	13.7%
5	Produce	135	Vegetables	0.1%	19.6%	42.2%	38.1%	50.4%	8.7%	13.2%	11.2%	0.1%	3.8%	12.7%
5	Produce	130	Fruit - 1	0.1%	20.7%	42.3%	36.9%	50.9%	8.5%	13.2%	11.2%	0.1%	4.2%	12.0%
5	Produce	122	Plants	0.2%	22.2%	41.4%	36.3%	50.9%	8.4%	13.2%	11.1%	0.2%	4.9%	11.4%
5	Produce	118	Fruit - 1	0.4%	25.2%	41.7%	32.8%	53.7%	7.7%	12.6%	10.4%	0.3%	6.1%	9.2%
5	Produce	136	Vegetables	0.0%	19.6%	43.2%	37.2%	51.0%	8.7%	13.2%	11.3%	0.1%	3.6%	12.2%
5	Produce	131	Fruit - 2	0.0%	20.3%	43.2%	36.4%	51.4%	8.6%	13.3%	11.3%	0.1%	3.7%	11.7%
5	Produce	123	Fruit	0.1%	19.5%	42.2%	38.2%	52.1%	8.5%	13.5%	11.0%	0.1%	4.2%	10.5%
5	Produce	119	Fruit – 2	0.1%	24.2%	43.1%	32.6%	54.4%	8.0%	13.1%	10.9%	0.2%	4.5%	9.0%
5	Produce	137	Vegetables	0.0%	18.7%	43.0%	38.2%	50.9%	8.6%	13.1%	11.1%	0.1%	3.6%	12.6%
5	Produce	132	Fruit – 3	0.0%	19.8%	43.5%	36.7%	51.5%	8.6%	13.3%	11.2%	0.1%	3.7%	11.7%
5	Produce	125	Fruit – 2	0.0%	19.6%	42.9%	37.5%	52.2%	8.6%	13.7%	11.2%	0.1%	3.9%	10.3%
5	Produce	120	Fruit - 3	0.0%	24.0%	43.6%	32.4%	54.2%	8.1%	13.1%	11.0%	0.1%	4.1%	9.4%
5	Produce	138	Vegetables	0.0%	17.9%	43.0%	39.1%	50.8%	8.6%	13.2%	11.0%	0.1%	3.5%	12.8%
5	Produce	139	Bagd Salads	0.0%	16.3%	42.5%	41.2%	50.6%	8.7%	13.2%	10.9%	0.1%	3.5%	13.1%
5	Produce	140	Bagd Salads	0.0%	15.6%	41.8%	42.5%	50.5%	8.7%	13.0%	10.5%	0.1%	3.5%	13.6%
5	Produce	133	Fruit - 4	0.0%	17.7%	43.3%	39.0%	51.1%	8.6%	13.3%	10.9%	0.1%	3.5%	12.5%
5	Produce	127	Fruit – 3	0.0%	19.2%	43.4%	37.4%	52.2%	8.4%	13.6%	11.2%	0.1%	3.8%	10.8%
5	Produce	129	Fruit - 4	0.0%	17.0%	42.2%	40.8%	51.0%	8.4%	13.2%	10.9%	0.0%	3.6%	12.9%
5	Produce	121	Fruit - 4	0.0%	22.6%	44.1%	33.2%	53.6%	8.2%	13.1%	11.1%	0.1%	3.8%	10.0%
6	Organic	0	0.0%	13.8%	40.1%	46.1%	50.0%	8.7%	12.8%	10.4%	0.0%	3.4%	14.7%	
6	Produce	141	Org Produce	0.0%	13.8%	40.1%	46.1%	50.0%	8.7%	12.8%	10.4%	0.0%	3.4%	14.7%
7	Wine	0	0.0%	23.9%	43.7%	32.3%	54.0%	8.2%	13.0%	11.1%	0.1%	3.8%	9.9%	
7	Wine	143	Wine	0.0%	23.9%	43.7%	32.3%	54.0%	8.2%	13.0%	11.1%	0.1%	3.8%	9.9%

Eye on Profits – Produce idea

Secondary placement of “grab and eat” foods like apples, oranges and or bananas in the C-store area might result in sufficient incremental sales to justify the effort.

Area Analysis – The “C-Store” section

There is less detailed analytical information for the C-store area than for any other area of the store. There are a variety of reasons for this lack of data, foremost of which is that the shorter the trip, the more difficult it is for PathTracker™ to detect and analyze it. This is further compounded by the fact that very short trips are most likely to be conducted without the benefit of a cart or basket (the means for PathTracker™ observation.)

However, the absence of details does not mask the overwhelming quantitative data supporting the C-store concept. First and foremost of these facts is that only about half the shoppers enter the racetrack and pass through produce or on the main aisle between the service deli and produce. About 20% of all shopping trips are identified as only visiting the area between the entrance and the checkout stands, typically the first checkout that they come to, which is at the service desk. These are the TripTypes: Pattern™ identified as “C-store.” Nearly half the trips take less than 10 minutes, with 12% taking less than 2 minutes. These 2 minute quick trips cover less than 500 lineal feet, including back and forth, in the store. A third of all shoppers cover less than 750 feet in the store.

Other than through the entry and the beginning of the racetrack, there is substantially reduced traffic of the 10-20 minute routine type trip through the area, and very little of the center-of-store aisle type traffic. Interestingly, in addition to the C-store pattern, there is about twice as much destination pattern for the Chinese restaurant as for the store as a whole. This means that about 5% of the shoppers in that subzone go straight there from the entrance, and then straight to the checkout, without visiting other areas in the store.

A number of subzones immediately contiguous to the C-store area have been identified as having some C-store type shopping. These include subzones at the very front of aisles 11 and 12 (subzones 49 and 32, respectively) and the first four front endcaps (nearest the entrance, subzones 27 – 30).

Otherwise, the main body of the C-store section is the entry itself, the service bakery and the Chinese restaurant. These areas are characterized by five to fifteen times the average EyeShare™ (“GRP”), which means they are getting a lot of visual exposure, probably from all classes of shoppers, not just the C-store shoppers. This is because there are no high displays in the area, affording a relatively unobstructed view of the entire area from all points within the area. However, the EyeShare™ (“GRP”) is typically not driving commensurate sales.

VitalQuadrant™ analysis identifies four of six subzones as being “ineffective” in translating EyeShare™ (“GRP”) into sales. However, VitalQuadrant™ analysis of DoubleConversion™ shows no “underdeveloped” subzones in this area, suggesting that for the traffic visiting the area, there is a reasonable level of shopping going on, with a normal amount of purchasing for the amount of shopping.

As expected, a high percentage of shoppers visit the “C-store” area, and purchases here occur very early in the shopping trip, with Order-of-10™ being in the 0.4 to 2.5 range, except for the Chinese restaurant and the service desk (including the checkout). These latter locations have Order-of-10™ scores in the 4 to 6 range. This midrange (halfway between 0 and 10) does not necessarily mean that purchases are occurring halfway through the shopping trip. It is likely that shoppers are purchasing here early in their trip, or alternatively, at the end of their trip. The net result would be an average Order-of-10™ in the midrange.

BuySpeed™ is very slow at the Chinese restaurant, which is probably a consequence of waiting several minutes for an order, or leaving the cart at this location while the meal is consumed in the dining area. The primary concern here would be the potential congestion with a long BuySpeed™ and heavy traffic.

Eye on profits – C-store suggestion

Keeping in mind that we only need to increase sales a few percent to double or more the profit for the store, the C-store area seems like a fruitful area for improvements. Typical national C-store sales are reflected in this table:

TOP TEN PRODUCT CATEGORIES

AS A PERCENTAGE OF C-STORE SALES

Rank	Products	1999	2000
1	Cigarettes	34.9%	35.8%
2	Foodservice	13.6%	13.3%
3	Packaged Beverages	11.0%	12.3%
4	Beer	11.2%	10.9%
5	Candy	3.9%	3.9%
6	Salty Snacks	3.0%	3.4%
7	Fluid Milk Products	3.0%	2.8%
8	General Merchandise	3.2%	2.7%
9	Packaged Sweet Snacks	1.6%	2.3%
10	Other Tobacco	1.2%	1.5%

Source: 2001 NACS/CSNews Industry Databank

Table 1. C-Store Sales Nationally

This shows the categories for focus in further development of the C-store concept. Cigarettes are already at the service desk. Foodservice could be expanded by facing the service deli toward the C-store section (trading with bakery) and adding items like hot dogs, BBQ chicken, etc. The Chinese restaurant should be encouraged to develop self-service merchandising for menu items that could be available during hours when service is not available.

Beverage service could be moved with the bakery/deli swap, and additional reach-in soft drink capacity could displace non-C-store merchandise (such as carpet pieces). Making packaged beer available from the reformatted service deli area or from behind the counter at the service desk might be effective. If it is not possible to merchandise beer nearer the C-store section, at a minimum, direction signs, floor footprints, or other devices need to connect these sections. A low wattage blinking sign beside the current beer cooler, and facing the distant C-store might help.

Candy, salty snacks and general merchandise should be organized on vertical shelf fixtures that are no more than 60" high, to permit good visual exposure around the area, and also to facilitate monitoring for shoplifting.

Moving some C-store merchandising into this area is a positive step. But to get the full value, a designed, integrated and permanent set-up would be helpful.

Basket Shoppers, Temporal Trends

“Basket shoppers” are less likely to visit C-store subzones and are very unlikely to visit the Chinese restaurant. Almost none get into the serving/dining area. All this is probably due to the limited number of C-store items in the C-store area, and the rush that these shoppers may be in.

Basket shoppers are significantly more likely to visit the produce+ area (floral, produce and wine) and the early portions of the racetrack, including the endcaps. Their center-of-store aisle shopping is more concentrated in the first four aisles near the entry (aisles 9-12, zones 24-27).

The lower visits to the C-store suggests that by selecting a hand basket for shopping, shoppers are signaling intent to shop the racetrack and produce and are likely to exit to checkout through the first few center-of-store aisles.

Of the total number of trips detected by PathTracker™, 12% were with baskets. The actual proportion of basket trips is almost certainly higher for three reasons:

- Only about half the hand-baskets were actually tagged.
- Baskets are made available at other points (e.g., Subzone 153) than at the entry. “Trips” begun at this location will be ignored by the trip algorithms in place at this time, thus depressing the share of basket trips.
- Short trips are inherently more difficult for PathTracker™ to distinguish from the “noise” of parked, abandoned or non-trip carts. Again, missing some short trips probably depresses the proportion of basket trips.

Given the significant volume and distinctive character of hand basket shopping, further analysis is probably warranted.

Temporal measures are strictly dependent on the time periods specified and were arbitrarily selected as follows:

Day parts:

Morning = 6 a.m. to noon

Afternoon = noon to 4 p.m.

Evening = 4 p.m. to midnight

Seasons:

Summer = August/September

Fall = October/November

Winter = December

The “season” specifications are stretched from the usual definitions to attempt to identify any seasonal effects, and will be conformed to the common definitions when full-year data is available.

In the C-store area the Chinese restaurant area deviates most from the store averages with more morning visits and fewer visits in the fall. It is possible that those numbers are a reflection of the use of the serving/dining area. With expansion of food service in the C-store area, this serving area might be made more commodious to encourage lingering/shopping, e.g., by having a newspaper rack readily available, or possibly even table games (checkers?) to encourage visits. Selection and management of activities here must carefully distinguish between desirable and undesirable loitering. But the negative potential shouldn't discourage searching for traffic/sales building opportunities.

Produce, floral and wine all seem to be most heavily shopped in the afternoon with reductions, particularly of floral, in the winter.

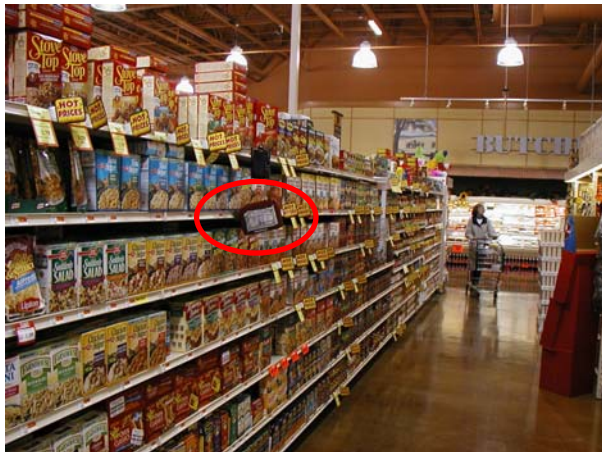
The racetrack seems to have less traffic in the morning (with the exception of the deli).

Afternoons and the fall season tended to have more than average racetrack traffic.

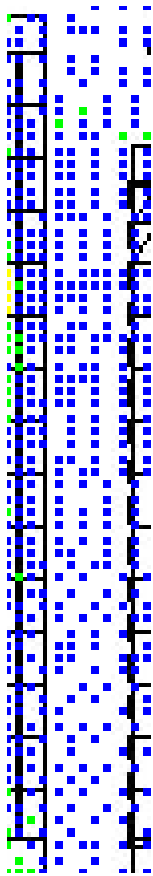
Center-of-store aisles are definitely shopped more heavily in the afternoons and at a reduced rate in the mornings. Seasonality saw some increase in the fall and decrease in the winter.

A Merchandising Experiment

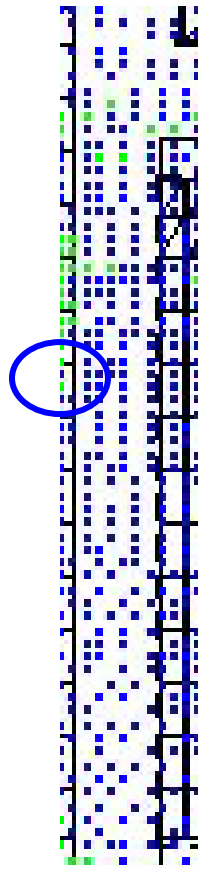
Early in the PathTracker™ study it was noted that one aisle (aisle 10, zone 25, subzones 53-58) was receiving very little traffic (and sales). In an effort to rectify this situation and drive traffic to this aisle, a special coupon and dispenser were installed about halfway down this aisle. A moving LED sign was also placed at the entrance to direct shoppers' attention to the coupon, and at the time of introduction, a greeter at the door called shoppers' attention to the presence of the coupon. The coupon was for one dollar off on any three dollars of store brand purchases.



The before and after density of shoppers in this aisle are as follows:



Before



After

The aisle on the left represents shopper traffic the month before the coupon dispenser was installed, at the location shown by the blue circle on the aisle at the right. Each blue dot represents one square foot of very low density. Green is of just slightly higher density.

The diagrams show just a bit more density (green dots) in the month during the experiment than before.

This data is numerically represented in the table below, which shows a constant 8% rate of shopper visits to the center area of the aisle. However, the table also confirms a possible 2% increase in overall visitation to the aisle, which is primarily due to increased activity near the back of the aisle.

		Pre-Coupon	Post-Coupon
Sub Subzone		September	October
0		28%	30%
53	(E) Mexican Specialties	19%	22%
54	(W) Tomato Products/(E) Mexican Sauces	12%	13%
55	(W) Dried Pasta/(E) Mexican Salsa & Beans	8%	8%
56	(W) Pasta Sauces/(E) Canned Beans	9%	8%
57	(W) Spice Mixes/(E) Dried Beans, Rice & Mixes	10%	9%

The Future - PathTracker™ Plans and Possibilities

The inaugural study reported here represents performance in one suburban supermarket from August through December of 2001. The nature of many of the findings suggests that they are likely to be confirmed by installations at subsequent stores. Indeed, PathTracker™ observations tend to confirm other independent studies and observations:

- The majority of shopping is unplanned (purchases are driven by location, not product.)
- Shoppers look at less than 20% of the displays they walk past (EyeShare™ does not strongly influence purchases.)
- Shoppers are repulsed from entering aisles (confirmed by the low number of visits to the central parts of aisles and high percentage of “excursion” trips.)

However, for the time being they must be strictly considered as hypotheses. On the other hand, the PathTracker™ Tool Suite represents a major advance in quantitative thinking about the supermarket environment and is a part of Sorensen Associates’s long-standing efforts in Supermarketology®.

In addition to installations in other, nationally dispersed, supermarkets, PathTracker™ will be deployed in other CPG channels (C-store, mass merchandise, etc.), but also into non-CPG retail environments. As this expansion occurs over the months and years ahead, it is likely that some new tools will be developed, and some existing tools may be of lesser value. We expect the key findings identified here to be validated, or in some cases modified. As expansion into other channels occur, certainly new findings and merchandising “rules” will be discovered.

As presently deployed, PathTracker™ is essentially a *research* and merchandising tool. It is our goal to make this a *management* and merchandising tool. That is, rather than providing

information on past performance, PathTracker™ will provide current store traffic and shopping behavior, along with manager actionable steps to improve merchandising and sales *now* and continuously.

Though still in the research mode, the test store has made a number of merchandising adjustments (after the test period). In future, the impact of each of these activities will be evaluated.

The C-store Format



Before

After

Before January 15, as shoppers entered the store and picked up their carts, their view to their immediate left was of tables laden with fresh baked goods. To their right was the deli, floral and produce areas. Of particular interest is the refrigerated case right below the large “bakery” sign. In the “before” configuration, this was dedicated to chilled baked goods. In the “after” configuration, the budding elements of a C-store format can be seen. This includes milk, sandwiches and other C-store items in the chilled case, as well as the readily visible soft drinks, chips, candy and other snacks.

Chips: Pickles vs. Potato



Before



After

Before March, aisle #1 on the racetrack (which is usually the last one visited) was pickles, salad dressings and various salad amendments. This was right across the very wide aisle (typically with pallets of soft drinks or other promotional merchandising) from the cold beverage wall.

Z	Sub	SubZone	BEHAVIOR			CONVERSION		
			VISIT OR PASS	PAUSE OR SHOP	PURCH	VISIT TO SHOP	SHOP TO PURCH	OPPORTUNITY QUADRANT
		ALL SHOPPERS	100%	100%	100%	100%	100%	
		N =	24758	24758	60574			
16	0	DressingsPickles	20%					
16	102	Pickles	14%	5%	1%	36%	16%	Underdeveloped
16	103	Steak/BBQ Sauce, Catsup, Olives, Peppers	9%	6%	2%	63%	32%	Niche
16	104	Salad Dressings, Mayonnaise, Mustard	7%	4%	2%	53%	62%	Niche
16	105	Salad Amendments, Vinegar	10%	5%	2%	47%	34%	Niche

The data in the table is the “before” situation showing that pickles were not effectively converting visitors to shopping, nor shoppers to purchasers. It makes a lot of sense to move a merchandising leader like salty snacks into this location, putting the niche dressings and underdeveloped pickles in an interior center-of-store aisle.

The Aisle “Womb”



Before



After

Shoppers exhibit genuine resistance to passing through long store aisles where they are walled in on both sides. Placing an arched display across the aisle at the half-way point provides a large exposure/merchandising opportunity while at the same time breaking the long aisle to an extent. This creates a more womb-like, comforting environment which may attract shoppers.

The PathTracker™ Tool Suite

EyeShare™ (“GRP”).

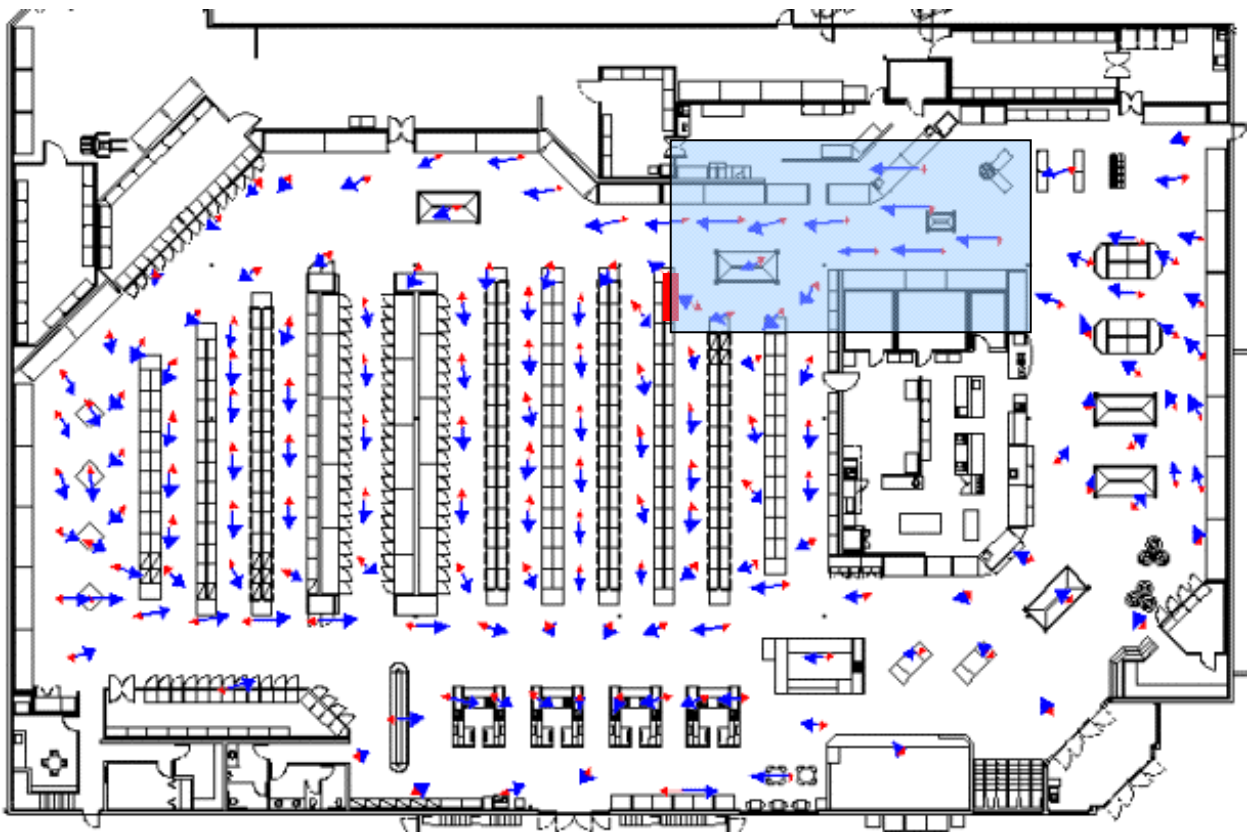
An old adage says that we eat with our eyes first. The truth of this principle can be extended to say that “we buy with our eyes first.” Therefore, PathTracker™ begins with a quantitative measure of the visual impact of every display in the store. EyeShare™ (“GRP”) in itself says nothing about the attractiveness or effectiveness of the display (which can be inferred by comparing to EffectiveDistribution™), but simply the share of eyeballs in the store that can *potentially* be seen and impacted by the display. EyeShare™ (“GRP”), which is expressed as an index, incorporates measures of the numbers of shoppers, time and their varying distances from the display, their angle of sight to the display (based on their direction of travel) and the orientation of the display to their line of sight (referred to as the aspectual angle.) EyeShare™ is analogous to the Gross Rating Points (GRP’s) of advertising.

Since the goal of the retailer is to maximize profitable sales, it is essential to allocate products to optimize EyeShare™ (“GRP”). How this can be done will become more apparent as we consider subsequent tools. But, in general, high volume, high profit items should be allocated the most EyeShare™ (“GRP”) with underdeveloped products and categories (defined below) allocated to lower EyeShare™ (“GRP”) displays.

This introduces an important counterintuitive principle that will be confirmed repeatedly by the PathTracker™ system tools: *Do not attempt to increase the EyeShare™ (“GRP”) for a display; rather, seek to make effective use of the EyeShare™ (“GRP”) that already exists with the multitude of displays that are in the store.* For the manufacturer, this means presenting the retailer with rational arguments for gaining additional EyeShare™ (“GRP”) for clear winners,

while gracefully accepting the loss of EyeShare™ (“GRP”) for other products and categories that are less deserving because of lesser shopper interest and fewer purchases.

For the inaugural PathTracker™ store, one zone illustrates the potential for improved merchandising effectiveness, based on EyeShare™ (“GRP”). Examination of the traffic flow in the store shows an interesting subzone at the back of aisle 10 (the store is divided into 30 zones or departments, 170 subzones or sections and 600 categories). The display in this particular zone is noted as a red bar on the following diagram, which shows the general flow of shoppers through the store:



Based on the flow of traffic, the highlighted rectangle encompasses all those subzones from which shoppers may see the display in question. Shoppers have a significant view of this display

from some of the most heavily traveled subzones in the store. However, the resulting EyeShare™ (“GRP”) for the display is only 58, which is a little more than half the exposure of the average display in the store, but just about average for a center-of-store aisle.

This display gets reasonable exposure from its visibility, and a good level of traffic (it is in the top 20% of grocery aisle subzones in terms of shopper visits). However, the visibility (EyeShare™ (“GRP”)) and high traffic (EffectiveDistribution™, see below) do not deliver sales.

The number of sales from this zone are lower than from any other grocery display in the store.

A tiny 0.3% of shopping trips result in a purchase from this premium display. A casual perusal of the display can probably indicate why:



The ethnic foods, Advent candles, and bulk packages are unattractive to the great majority of shoppers in this store. Therefore, this merchandising asset (visibility, traffic) could be turned into greater profits with any number of products (candidates are identified from other analyses).

EffectiveDistributionTM

Where EyeShareTM (“GRP”) counts eyeballs, EffectiveDistributionTM counts bodies. It is necessary for shoppers to not only *see* the products (which can be done from a distance) but they must actually visit the area immediately adjacent to the display in order to complete a purchase. When a product is immediately adjacent to a shopper, we say that the product has been *effectively distributed* to the shopper. This is a simple but important concept. It is common to measure the distribution of products by determining the percentage of the national market to which the product is distributed, measured as a percentage of All Commodity Volume (ACV). However, this presumes that if the product is in 80% of the stores, that it is reaching 80% of the shoppers.

This is not true. For example, if only 20% of shoppers in the distributed stores visit the shelf or display where the product is offered for sale, the *EffectiveDistribution*TM will be 20% of 80% or only 16%, a long way from the original 80%*.

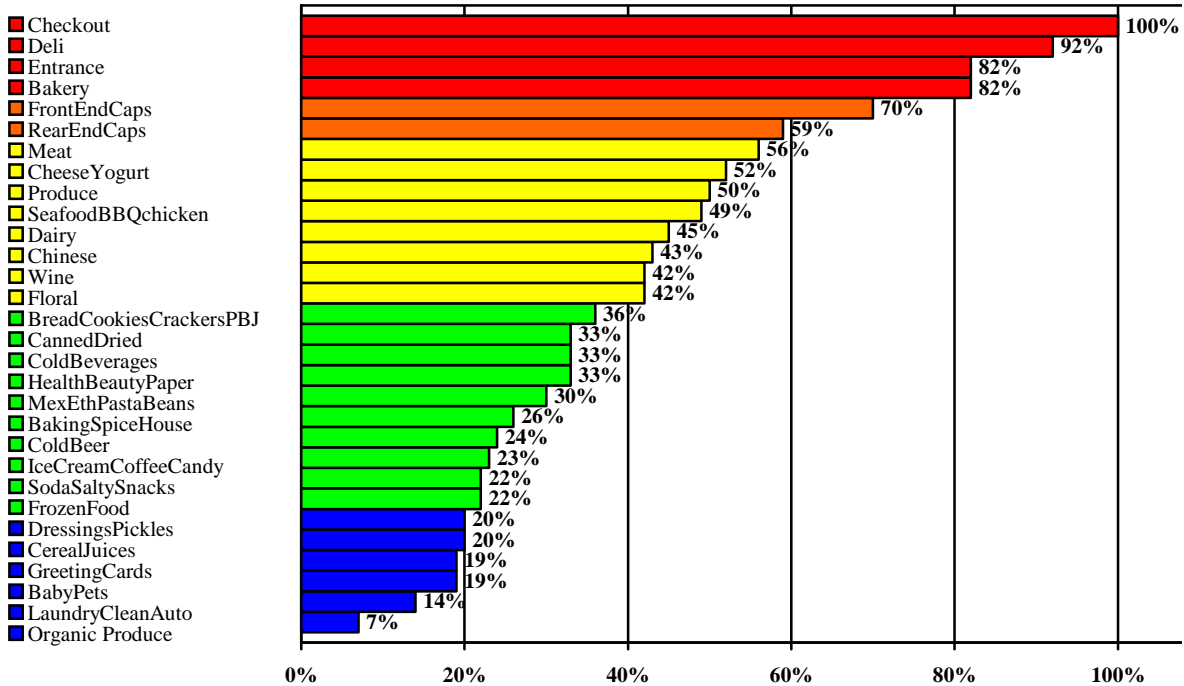
There are at least three causes for shoppers to visit any given area:

1. They see the area (EyeShareTM (“GRP”)) and are attracted to it.
2. It is between two other points on their trip so they are just passing through.
3. The area is a destination they are consciously seeking in order to shop or purchase.

This can explain why the relation between visiting an area and purchasing is not more closely correlated.

* Since the inaugural PathTrackerTM store does not have a “club card” program, individual shoppers are not identified. Hence, the behavior of a single shopper on multiple trips cannot be assessed. If 20% of trips visit an area, the percentage of shoppers visiting that area over time may be significantly higher because shoppers may visit alternate areas on subsequent trips. For our purposes here, within a single store, the percentage of shoppers who visit or pass an area can be treated as the EffectiveDistributionTM.

EffectiveDistribution™

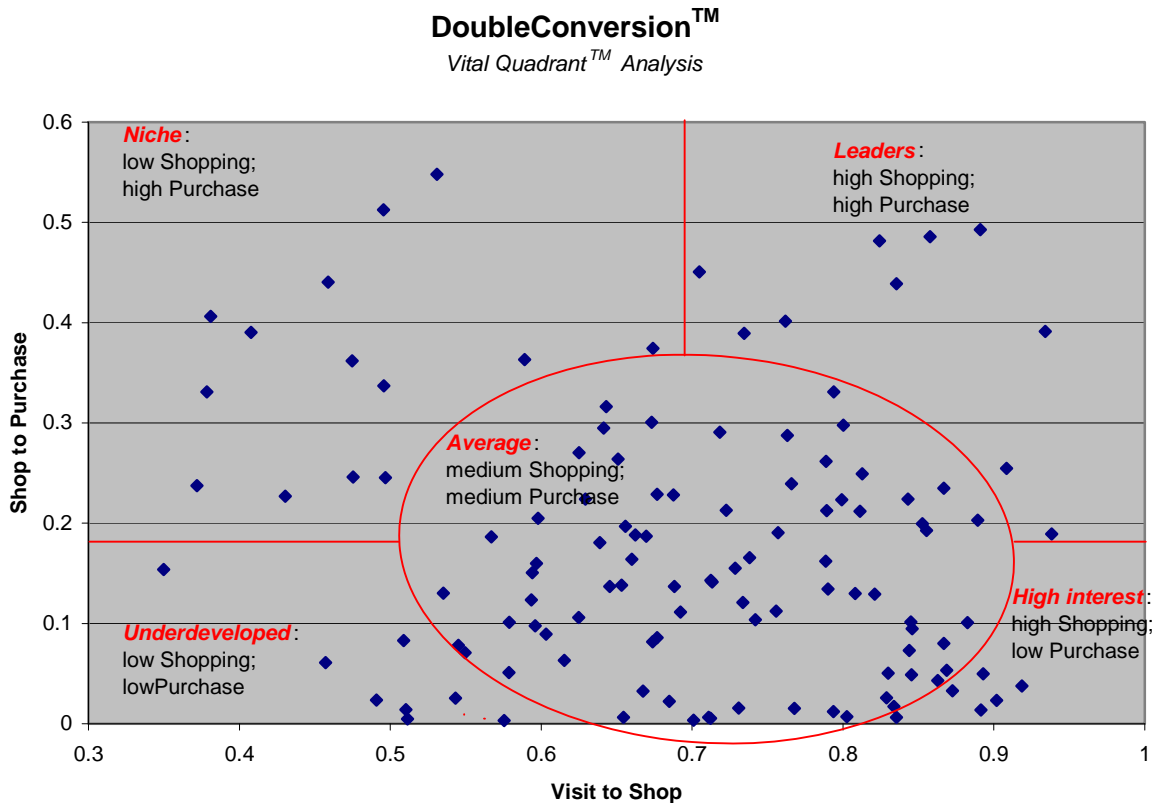


Even though these EffectiveDistributions™ are titled by the products being featured, they can just as well refer to the *locations*. Thus, SodaSaltySnacks actually refers to aisle 2 which had those items at the beginning of the test. Later, after completion of the test period this location became “SodaDressingsPickles,” with SaltySnacks moving to aisle 1.

DoubleConversion™

This refers to the two conversions that must occur once the shopper enters the area where a product is on display. First, the shopper must slow up or stop in order to get into the shopping mode. This is the visit-to-shop conversion. The second conversion is from shopping to actually

making a selection for purchase. This is the shop-to-buy conversion. These two conversions can be graphically analyzed using the VitalQuadrant™ analysis*.



VitalQuadrant™ analysis

The four VitalQuadrants™ for the DoubleConversion™ are designated, along with merchandising guidelines, as follows:

* The VitalQuadrant™ analysis is similar to the traditional quadrant analysis, with the added feature that two thirds of the pairs are removed from consideration by classifying them as average. This leaves the remaining one third, the “vital few,” (per Juran) for focus and attention. This methodology is particularly important with a system such as PathTracker™, which can produce enough statistics to choke an analyst. Under such circumstances, selection of the vital few becomes of tremendous importance, and enhances the efficiency of response to problem or exceptional conditions.

VitalQuadrant™	Characteristic	Merchandising
Leader	Good job of merchandising - shoppers who pass here stop to shop; and then buy	Should tend to be in high traffic, high EffectiveDistribution™ areas with good EyeShare™ (“GRP”).
High interest	Attractive merchandising - shoppers stop to shop, but don’t buy	Should be readily visible from racetrack, but not in prime space. Improve purchase conversion.
Niche	Effective merchandising - few stop to shop, but those who do buy	Locate “niche” sections in lower traffic adjacent to correlated purchases.
Underdeveloped	Poor merchandising - few stop to shop; and few who stop, buy	Move “underdeveloped” sections to out of the way, low traffic areas.

It is important to make a distinction between good merchandising and high sales. Visibility and traffic can improve the sales of nearly anything. But visibility and traffic are the most important merchandising assets the retailer has. It is imperative that these be allocated to products that will deliver the best sales and profits. The DoubleConversion™ quadrants identify the best candidates for merchandising improvements.

One application of this principle was the swapping of “underdeveloped” pickles on the high traffic racetrack (perimeter) with “leader” salty snacks, which had been located on an interior aisle. Each merchandising adjustment of this type has the potential to swell sales toward the few percentage increases we seek, with concomitant doubling or more of profits.

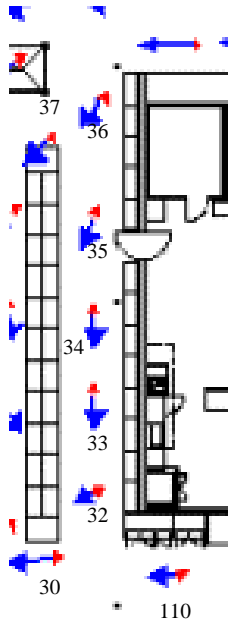
The next few measures, along with the TripTypes, give some insight into the state of mind or thinking of the shopper at the point they are making their purchase.

Order-of-10TM

Order-of-10TM identifies the point in the shopping trip in which the purchase is made. Each trip is divided into 10 segments by length (deciles), and the segment (of the 10) in which the purchase is made is noted. All purchases for a section are then averaged to yield a number that reflects at what point the purchase typically occurs. An Order-of-10TM value of 5 would indicate that these items are purchased at the half way point in their shopping trip. Scores of 2 or 3 indicate purchases made earlier in the trip, just as 7 or 8 would indicate later purchases. It should be noted that if purchases in the store occurred in random order, all Order-of-10TM scores would be near 5. In fact they range from near 0 to near 10. This is further confirmation of the fact that there is order in purchasing. Moreover, what should be obvious at this point is that the order is driven by the physical location of the products in the store, not by the products themselves.

This last point is confirmed also by lack of meaningful results obtained from multiple efforts to establish directional correlations between purchases. That is, does the purchase of item x lead to the purchase of item y ? We cannot definitively answer *no* to this question, but we can certainly say that after considerable effort to answer *yes*, for this or that pair, we cannot. At this point, if the purchase of x leads to the purchase of y , we can conclusively say that this relationship is overwhelmed by the far stronger effect of the location of x and y .

The Order-of-10TM does provide some helpful confirmation and amplification of the traffic flow patterns. For example, looking at aisle 12, we see the following flow pattern:



Sub	SubZone	N =
		27,597
30	11-12 End Aisle, varies	4.2
32	(W) Nutrition Bars & Cookies/(E) Breakfast Bars & Fruit Snacks	3.6
33	(W) Cookies/(E) Peanut Butter & Jelly	3.7
34	(W) Crackers & Cookies/(E) Bread	3.4
35	(W) Crackers /(E) Bread	3.4
36	(W) Crackers & Cookies	3.3
37	11-12 End Aisle-S, varies	3.2
110	(E) Bakery	2.5

As might be expected, coming down the aisle from the back, purchases in SubZone 36 occur before those in 35, since traffic generally flows from 36 to 35. This continues with 34 and 33. However, purchases at 32 occur sooner in the shopping trip, on average, than for SubZone 33. This apparent anomaly is a consequence of the fact that we are looking at the *average* order of purchase. Notice that purchases at 110 typically occur much earlier in the shopping trip. Even though the Dominant flow and shopping in this aisle is from back to front, since many shoppers visit 100 (a bakery display) earlier in their trip, they also shop around the corner at 32, lower the *average* point of time in the trip when purchasing occurs for 32.

Although the statistical correlation is not strong, there is a general speed-up of shopping as the shopper nears completion of their trip. On average, shoppers take nearly twice as long to make purchases early in their trip as in the last few purchases. The Order-of-10™ score for a given category or product gives us some insight into the state of mind of the shopper at that point.

BuyLeft™/BuyRight™

Whether the shopper is selecting products from their right side or left side has great implications for the placement of products relative to traffic flow. It is not a matter of indifference whether a product is placed on the east side or west side of an aisle in which the dominant flow of traffic is from south to north. On an overall store basis it is 56% on the left and 44% on the right.

However, there are substantial areas in which we have compiled inadequate data on this subject (produce, fresh meat, etc., are largely excluded from this particular measure at present). In the center-of-store aisles, the percentage of shopping on the left varies from (all aisle averages) a high of 62% to a low of 57%.

This bias toward shopping on the left is further evidence of the importance of location over product. It is difficult to imagine a scenario across twelve aisles where management cleverly arranged products so that most purchasing would be on the left. In fact, the high percentage of left side shopping must be due to the natural tendency of shoppers (right-handed) to push the cart with their right arm, making visibility to the left better, and resulting in more purchases there. There is also the fact that it is natural for American shoppers to “drive” their carts on the right side of aisles, giving the shopper a clearer view to the left.

Does this mean that some products that are on the right will be missed, even if the shopper would otherwise have purchased them? Probably. But some products will be searched out and found regardless of their location. And it is always possible for a shopper to go both ways up (and down) the aisle. In fact, the large amount of “excursion” type shopping means that in many cases the shopper does pass the same product on both sides. (PathTracker™ cannot tell on which pass the purchase was made, so those double exposures are not tallied in the right/left analysis.)

BuySpeed™

BuySpeed™ is a measure of how long it takes a shopper to make the purchase, based on the amount of time they spend in front of the product. This is expressed in seconds, as is the total dwell time of all shoppers in the section. This second number is important in measuring the visual impact of a display (EyeShare™ (“GRP”)), since the longer a shopper is in an area, the greater the opportunity for a display to make a visual impact.

As has been previously noted, there is a general increase in the pace of shopping (decrease in BuySpeed™) as the shopper proceeds through the store.

Purchase Height

Purchase Height is the number of feet above the floor that purchased products are displayed. This measure (and the standard deviation from its average) tells us where shoppers are looking as they move around the store. Presumably purchases are being made at the level shoppers are looking; not elsewhere. The fact is that the average height of purchases is just over 3 feet (40 inches) and two thirds of all purchases occur between 22 and 57 inches in height. These facts raise serious questions about the value of eye-level merchandising.

Taken as a suite of measures, for any given section, category (and in some cases, product), the Order-of-10™, BuySpeed™, BuyLeft™/BuyRight™ and Purchase Height give insight into the thinking and behavior of the shopper at that particular point. The trends of these numbers over the whole store create a rich picture of shopping. The TripType: Length™ and TripType: Pattern™ address the shopper’s overall purpose and method of shopping.



Map & Glossary

All Commodity Volume (ACV) – The percentage of the national market to which a product is distributed.

Aisle Analysis – The study of shopping patterns that are repeated in similar aisles.

Aspectual Angle – The orientation of a display to a shopper’s line of sight.

BuyLeft™/Right™ – The pattern of a shopper in selecting products from either their right side or their left side.

BuySpeed™ – The number of seconds a shopper spends in front of a product before making a selection to purchase.

CAD Map – Computer Aided Design Map such as a floor plan.

Category Management – Determining the placement and merchandising of groups of similar products.

Checkout Magnet – The concept of the checkout and exit of a store drawing the shopper away.

Congestion Matrix – Quadrant analysis comparing the traffic in a location with the time it takes to make a purchase in that location (BuySpeed™)

Congruent Patterns – Similar, corresponding shopping patterns.

C-Store Shopping Pattern – (Convenience Store) Short trips that occur within the area between the entry and the checkout closest to the entrance/exit of a store.

Deciles – The ten equal portions of a trip, from beginning (1) to end (10).

DoubleConversionTM – The conversion from simply visiting (passing by) to shopping; and then the second change from shopping to making a selection for purchase (buying).

Dwell Time – The number of seconds a shopper (buyer *or* non-buyer) spends in a Subzone.

EffectiveDistributionTM – The placement of a product immediately adjacent to a shopper; as opposed to simply being in the store.

EyeShareTM (“GRP”) – An index which incorporates the number of shoppers (eyeballs); time spent at varying distances from a display; the shoppers’ angle of sight to the display; and the orientation of the display to their line of sight (aspectual angle).

GRP – Gross Rating Points, a measure of the number of consumers who will see advertising and the number of times they will see advertising.

Niche Product – A product that is specially attractive to narrow segment of shoppers.

Order-of-10TM – The point in the shopping trip in which a purchase is made. Each trip is divided into 10 segments by length (deciles) and the Order-of-10TM is the segment (out of 10) in which the purchase is made.

Outlier – An observation that deviates greatly (+/- 2 standard deviations) from the average.

PathTrackerTM – A merchandising system based on the patterns of behavior of shoppers leading up to purchases in the retail environment

Price Look-up (PLU) – Custom product/price codes assigned by a store, particularly for random weight items.

Psychocybernetic – Goal seeking, or directed towards a specific purpose.

Purchase Height – The number of feet above the floor that purchased products are displayed.

Reset – The rearrangement/relocation of products in a store.

Sales Density – Distribution of where products are being purchased throughout a store.

Shopper Density – Distribution of shoppers throughout a store.

Stock Keeping Unit (SKU) – Items for sale in the store, usually with a specific UPC or PLU code.

TripType: LengthTM – Classification of a shopper’s trip that is determined by length in either time or distance. Four types of this trip are Quick; Fill-In; Routine; Stock-Up.

TripType: PatternTM – Classifications of a shopper’s trip by the pattern of shopping behavior in a store. Four broadly defined types of patterns are Racetrack, Aisle, Destination, and C-Store.

Universal Product Code (UPC) – The bar code which identifies a product and its manufacturer.

VitalQuadrantTM – Analysis that focuses on only the “vital few” items that will deviate most from the average, and are most likely to have a merchandising impact.

Index for Data Table.

The first row of the table in the appendix has a column number for each zone or subzone. To find columns of interest, use the word index below to find columns in which that word is used.

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Data Table

Each zone and subzone is listed across the top of the table, with one column for each. These columns are numbered at the top of the columns, and these column numbers are indexed to all the products mentioned. The index is on the preceding page.

In addition to this indexing, the CD included with this report contains photos of every aisle display in the store (at the beginning of the study). These photos are named with the same column numbers as in the index. Appended to these column numbers are the subzone and *xy* coordinates of the display in the photo.