Lombard ReImagined

Technical Studies Report

Market & Traffic Analyses

June 2013

Swift Planning Group

Appendix D: Technical Studies Report

Contents

Overview and Purpose

This report summarizes two technical studies undertaken as part of the Lombard Re-Imagined project:

1. **A Market Analysis of the area surrounding the project corridor**
2. **A Traffic Analysis of the impacts of changing Lombard from its current form (two lanes in each direction) to one lane in each direction and a center turn lane**

The project team performed these analyses in order to shape recommendations and to provide evidence-based justifications for those recommendations.

I. Market Analysis

Swift Planning conducted a market analysis to determine what sorts of businesses were missing from the project corridor and to see what could be supported by the existing nearby residents. The data is from the City of Portland Bureau of Planning and Sustainability using ESRI's Business Analyst software. We looked at a few geographies, including just the corridor, a 1/4 mile walkshed (see Figure 1), and a 10 minute driveshed around the corridor. This summary was derived from the walkshed analysis.

Demographic Summary

The population of the Lombard area Walkshed is roughly 24,000 people as of 2012 and is expected to increase by over 1,000 people by 2017. Currently there are just under 10,000 households, 66% of which are owner occupied, and the other 34% renter occupied (see Table 1, next page).

Figure 1: Map of 1/4 mile walkshed around project area. The market analysis results discussed in this report apply to this area.

In terms of age, 26% of the population is under 18 years of age and roughly 8% of the population is above the age of 65. The median age is 33 years old.

The area is one of the more ethnically diverse neighborhoods in Portland with 67% of residents reporting as "White Alone" and 23% as non white. Figure 2 (next page) shows percentage of residents in each Census race category.

Market Potential

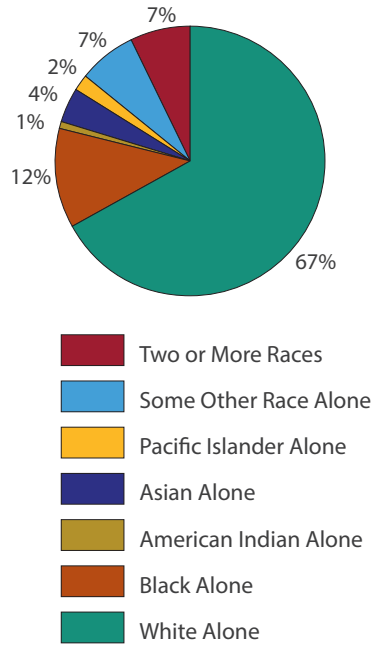
The majority of households within the community are solidly situated in the middle class, with a median disposable income of $33,439 and an average disposable income of $38,467. That adds up to a total yearly disposable income of $365 million. Figure 3 on the next page shows the number of households in the area by amount of disposable income.

Where and how this money is spent is the major focus of the market analysis. The

analysis showed the extent of the unmet potential for retail-oriented businesseswithin the Lombard walkshed. Nearly every retail sector studied revealed that the retail

Table 1: Population and household characteristics			
	2010	2012	2017
Population	23,528	23,956	25,324
Households	9.334	9,503	10,073
Families	5,116	5,161	5,448
Avg Household Size	2.45	2.46	2.45
Owner-Occupied Housing Units	5,804	5,803	6,125
Renter Occupied Housing Units	3,530	3,700	3,948

Figure 2: Walkshed Racial Distribution



options offered within the boundaries of the walkshed are not meeting the demand ofcommunity members living within walking distance of Lombard. That is to say, money that could be going to support local businesses that meet neighborhood needs is currently leaving the community.

This is quantified by the leakage/surplus factor, which is a comparison of supply and demand for certain services. The factor falls within a range from +100 to -100, with a number closer to +100 indicating that available retail is not meeting the demand; a number closer to -100 indicates a surplus of retail options that exceeds demand. Figure 4 (next page) shows the industries where leakage out of the community is occurring, ranked from highest to lowest. Furniture & home furnishing stores, sporting goods/hobby/book/music stores, and clothing/clothing accessory stores have the three highest leakage factors, indicating high unmet demand for those types of retailers.

Table 2 provides some more detail to this end. Column A shows the current number of business in each retail sector within the walkshed area of Lombard. Column B shows the corresponding retail gap, which expresses the difference between the amount of money spent by consumers at businesses in the area and the estimated amount that consumers have available to spend on those types of retail goods. In other words, the retail gap represents the amount of current dollars that are being spent outside of the area, which totals almost $125 million.

Column C on Table 2 shows the corresponding leakage factor. Retail sectors that currently have a large leakage factor (greater than 70) are highlighted. With the exception of motor vehicle and parts

Figure 3: Household disposable income

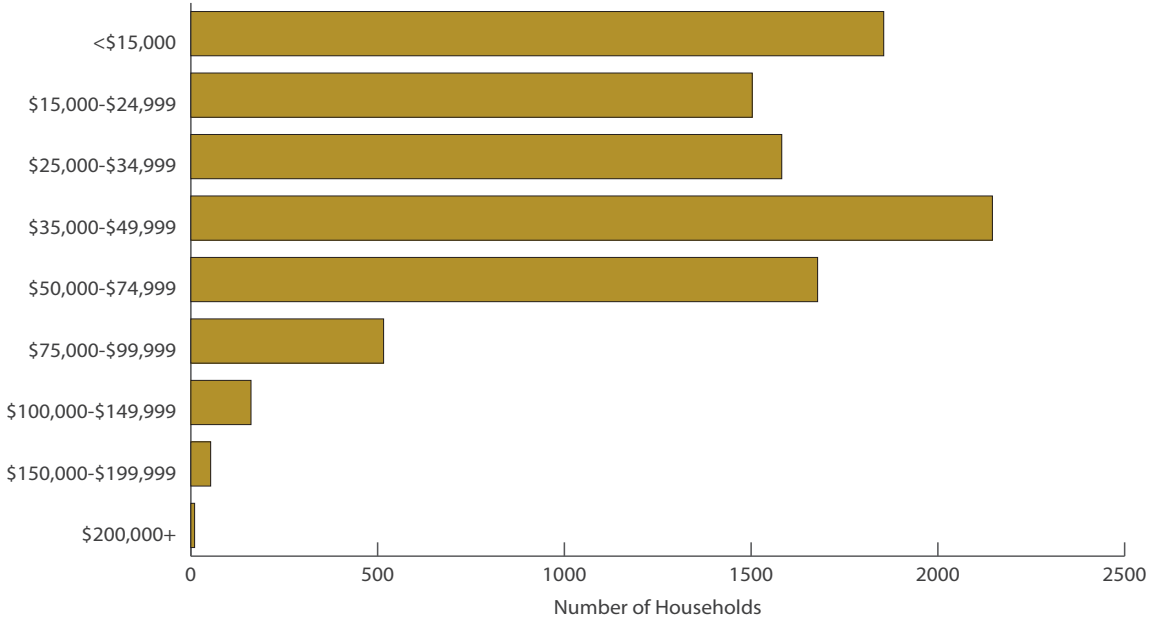


Figure 4: Walkshed business sector leakage

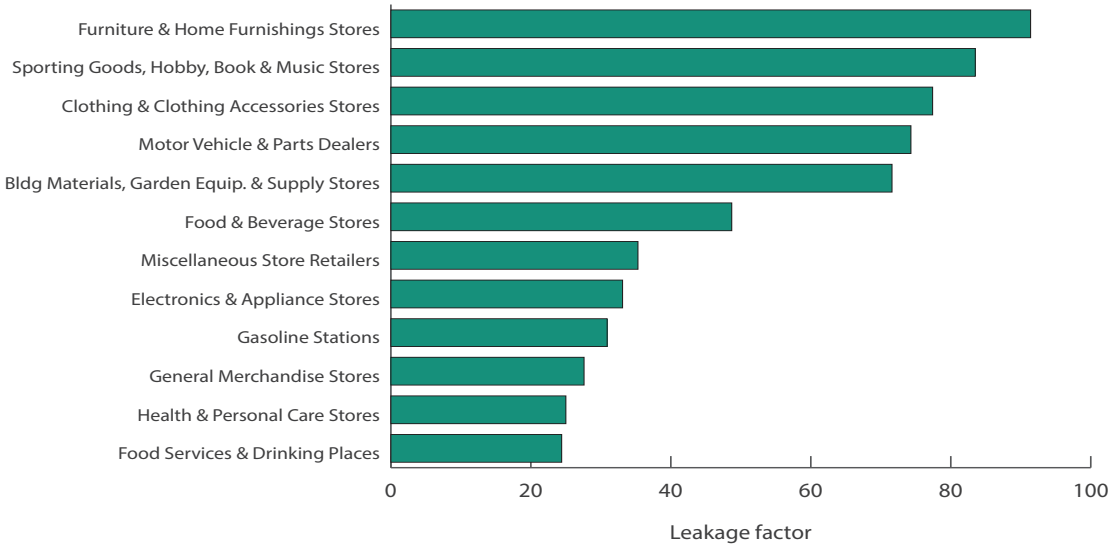


Table 2: Inventory of business types and supply/demand gaps in walkshed			
	Column A	Column B	Column C
Business Type (NAICS)	Current # of Business	Retail Gap	Leakage Factor
All Retail Trade	93	$124,649,163	46.4
Motor Vehicle & Parts Dealers	14	$32,844,142	74.3
Furniture & Home Furnishings Stores	3	$5,403,793	91.4
Electronics & Appliance Stores	6	$2,577,308	33.1
Bldg Material & Garden Equipment/Supplies Dealers	8	$4,969,712	71.6
Food & Beverage Stores	23	$23,449,404	48.7
Health & Personal Care Stores	3	$1,771,183	25
Gasoline Stations	5	$10,921,768	30.9
Clothing & Clothing Accessories Stores	3	$6,971,336	77.4
Sport Goods, Hobby, Book, & Music Stores	4	$2,346,733	83.5
General Merchandise Stores	2	$11,207,985	27.6
Miscellaneous Store Retailers	21	$1,758,451	35.3
Nonstore Retailers	1	$8,951,070	100
Food Services & Drinking Places	44	$11,476,276	24.4

dealers, these are all types of business that neighborhood residents have expressed a desire for on Lombard.

One caveat to this retail leakage analysis is that it does not fully account for the various types and markets of business types. While there are several food and drink establishments on Lombard, they are mostly take-out restaurants and taverns. There is a desire for full-service sit down restaurants and more family friendly eating and drinking establishments on the street. This analysis does not show the gap to the full extent as our survey and interview responses indicated a strong demand for more eating and drinking places. Considering the area's amount of disposable income, it appears that the nearby residents could support several more quality restaurants, cafes, and public houses.

Market Analysis Conclusions

Research and outreach conducted as part of the Lombard Re-Imagined project have identified community desire for more and better businesses on Lombard. This market analysis provides an argument that, economically speaking, the area can in fact support these establishments. Supply is not meeting demand, resulting in household disposable income leaving the neighborhood for many goods and services. Table 3 on the next page summarizes some of the key findings of this effort.

As the community works towards improving Lombard, many investment opportunities are likely to come. The analysis done here can help direct these investments in ways that both serve the community and yield good returns.

Table 3: Market analysis key financial takeaways	
Avg Mortgage Interest Spent	$3,273.75
Avg Mortgage Principal Spent	$1,354.15
Avg Rent Payment Spent	$3,271.94
Avg Other Household Expenses	$1,103.59
Median Disposable Income	$33,439
Per capita Income	$22,944
Total Retail Trade Demand	$196,788,198
Total Retail Sales Supply	$72,139,035
Retail Gap	$124,649,163
Retail Leakage Factor	46.4 out of 100

II. Traffic Analysis

Background

The Lombard Re-Imagined online survey results indicate that the community is concerned about traffic safety on Lombard Street. Respondents said that they do not feel safe crossing the street and that vehicles drive too fast there. These perceptions are supported by vehicle crash data, which show Lombard to have a high rate of crashes, especially rear-end and sideswipe incidents.

Conversations with business owners revealed concerns about on-street parking. Specifically, they felt that more and better on-street parking was needed. They said they worry about the safety of their customers parking on the street due to the high traffic speeds and narrow parking lanes.

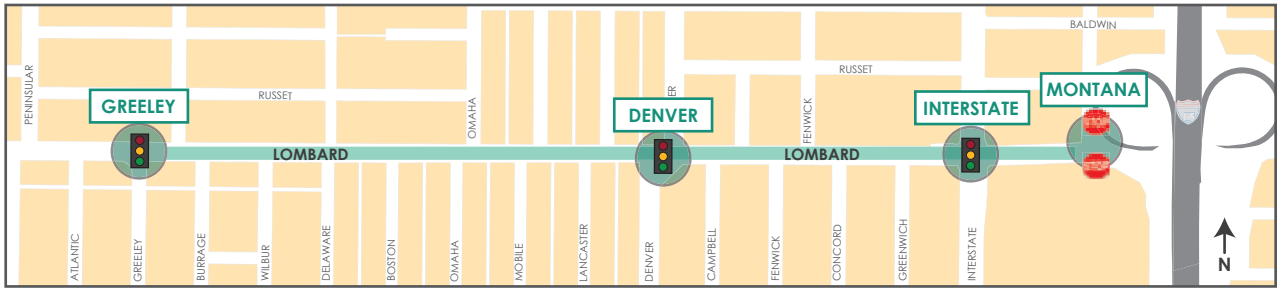


Figure 5: Segment and intersections of Lombard analyzed. Greeley, Denver, and Interstate are signalized intersections, while Montana is a two-way stop.

In order to address these concerns, the project team chose to evaluate the corridor for a change of lane configuration from two travel lanes in each direction to one in each direction and a center turn lane. The Federal Highway Administration recommends streets with average daily volumes of less than 20,000 as possible candidates for this type of reconfiguration, and the project area averages between 15,200 and 20,500 vehicles per day.

Interpreting the results of this analysis requires some familiarity with some terminology used in traffic engineering:

Volume-to-capacity (V/C): A ratio of how many cars drive on a street, in a lane, or through an intersection and the number of cars that street, lane, or intersection is designed to handle. A volume-to-capacity ratio of 1.0 means the number of actual cars using a facility is equal to that facility's capacity. Under 1.0 means there is extra capacity, while over 1.0 means capacity has been exceeded.

Delay per vehicle: The average travel time added to each driver's journey by driving in that particular location. For example, driving through the intersection at Lombard and Interstate currently adds about 44 seconds of delay compared to if the intersection did not exist or drivers never had to slow down to travel through it.

Level of Service (LOS): A letter grade (A-F) for a street, lane, or intersection that indicates how easily cars move through. It is based on delay per vehicle. Essentially a Level of Service 'A' means cars flow freely, while 'F' indicates heavy congestion.

Methodology

Because the feasibility of such a change depends on how it would impact traffic congestion, we conducted a preliminary traffic analysis of the busiest segment of the corridor, shown in Figure 5, using PTV Vistro. Vistro is a relatively new traffic engineering software that is meant for traffic impact analyses, signal timing optimization, and intersection level of service.

Data used for this analysis included the following:

- **Intersection geometry**
  - » **Obtained through observation and measured using Google Earth**
- **Peak hour (4:45pm-5:45pm) turning movement volumes**
  - » **Obtained from www.portlandmaps.com and Quality Counts transportation data collection services**

- **Signal timing and phasing data**
  - **Obtained from Portland Bureau of Transportation**

As a first step, the segment was analyzed for V/C levels, delay per vehicle, and level-of-service under its current design. East and west approaches at each intersection include one left-turn pocket lane, one through-lane, and one through/right-turn lane.

Next a scenario was created that changed the approach of each intersection to reflect a reconfiguration (referred to as the "3-lane scenario" in this report). It was assumed that the through/right-turn lane at each east and west approach would become a right-turn pocket, eliminating the through-movement from that lane. Signal timing and phasing was not adjusted under the new scenario.

Table 4: Intersection-level comparison of performance measures under the current and 3-lane scenarios

Intersection	Current	3-Lane Scenario
Volume to Capacity (V/C) Ratio		
Greeley	0.52	0.69
Denver	0.29	0.51
Interstate	0.45	0.68
Montana	0.57*	2.0*
Delay Per Vehicle (seconds)		
Greeley	16.7	22.9
Denver	22.7	30.0
Interstate	43.6	139.0
Montana	5.5	53.1
Level of Service		
Greeley	B	C
Denver	C	C
Interstate	D	F
Montana	F	F

*Worst movement V/C (southbound left turn)

Results

Table 4 compares V/C, delay per vehicle, and level of service at each intersection before and after a lane reconfiguration. In many respects these results indicate that reducing the number of through-lanes to one at both Greeley and Denver would not dramatically increase delay or push those intersections beyond their capacity.

Interstate and Montana, however, show some potential problems. While delay is already

Table 5: Comparison of volume-to-capacity (V/C) ratios for eastbound and westbound movements before and after a lane reconfiguration

Eastbound						
Intersection	Current Configuration			3-Lane Scenario		
	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
Greeley	N/A	0.51	0.54	N/A	0.85	0.20
Denver	0.65	0.42	N/A	0.65	0.80	N/A
Interstate	0.16	0.44	0.44	0.16	1.16	0.06
Montana	0.04	0.01	0.00	0.04	0.01	0.00
Westbound						
	Current Configuration			3-Lane Scenario		
	Left Turn	Through	Right Turn	Left Turn	Through	Right Turn
Greeley	0.38	0.40	N/A	0.14	0.72	N/A
Denver	0.17	0.30	0.30	0.17	0.74	0.11
Interstate	0.34	0.38	0.38	0.34	0.85	0.13
Montana	0.20	0.01	0.00	0.20	0.01	0.00

high at Interstate, it would more than triple under the 3-lane scenario. The fact that volume-to-capacity remains relatively low at Interstate suggests that this delay may be confined to a single movement, which will be discussed next. The problems that result at Montana (V/C of 2.0 and delay of 53.1 seconds) are due to a problematic southbound left-turn movement from Montana onto Lombard.

Because this analysis was undertaken with the primary goal of evaluating impacts on Lombard (as opposed to its cross-streets), the effects on eastboundand westbound travel are important to examine. Table 5 shows how reconfiguring the lanes on this segment would impact volume-to-capacity for specific movements through the intersection. Under the 3-lane scenario the only movement exceeding a 1.0 V/C ratio is eastbound traveling through at Interstate. Additionally, right turn movements improve in all cases because under the 3-lane scenario right-turning vehicles are no longer sharing a lane with cars driving straight through intersections. Left turn movements remain largely unchanged.

Finally, Table 6 compares level of service for east and west-bound approaches before and after reducing the street to one travel lane in each direction and a center turn lane. This measure considers all approaching lanes together. Notable findings include minimal impact, again except approaching Interstate. There eastbound LOS goes from 'C' to 'F' while westbound moves from 'C' to 'D'.

Table 6: Level of service comparisons before and after a lane reconfiguration

Eastbound		
	Current	3-Lane Scenario
Greeley	B	C
Denver	C	C
Interstate	D	F
Montana	A	A
Westbound		
	Current	3-Lane Scenario
Greeley	B	B
Denver	B	C
Interstate	C	D
Montana	A	A

Traffic Analysis Conclusions

Using available data and under the assumptions described, a lane reconfiguration appears to be technically feasible for much of the project corridor. As expected, volume-to-capacity ratios and intersection delay both increased under a 3-lane scenario, but often the increase was relatively small.

A major exception to this was he intersection of Interstate and Lombard, which saw significantly increased congestion from the change. Certain mitigation options could be explored to address this, including signal timing or keeping the current configuration for a stretch before and after the intersection.

Given community desire for a change to the way Lombard operates and the results presented here, a more detailed and precise traffic study of the corridor seems warranted.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