

Verification and Validation Handout

SELP 695: Systems Engineering Integrative Project

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Advisor

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a) General assumptions for this demonstration:

Family Situation	Mortgage Amount
Location CA 90025	Type 30 year Fixed Jumbo FHA
Married -Income 75k each	Interest 3.5%
Monthly other debt \$500	APR 4.349%
Credit Score - Very Good	
Annual Homeowner Insurance 0.50	Current Rent Payments:
Inflation 2%	Monthly Rent \$2500
Annual Maintenance Fee 1.50%	
Annual Home Value Increase 2%	
No Kids	

1. Find Out if You're Ready to Buy a Home

For this demonstration, we assume that the end user is looking primarily for a house but is open to purchase a condominium over renting an apartment. Furthermore, we assume that he or she arrives at the “you are ready to buy a house” box after taking the decision tree graph below.

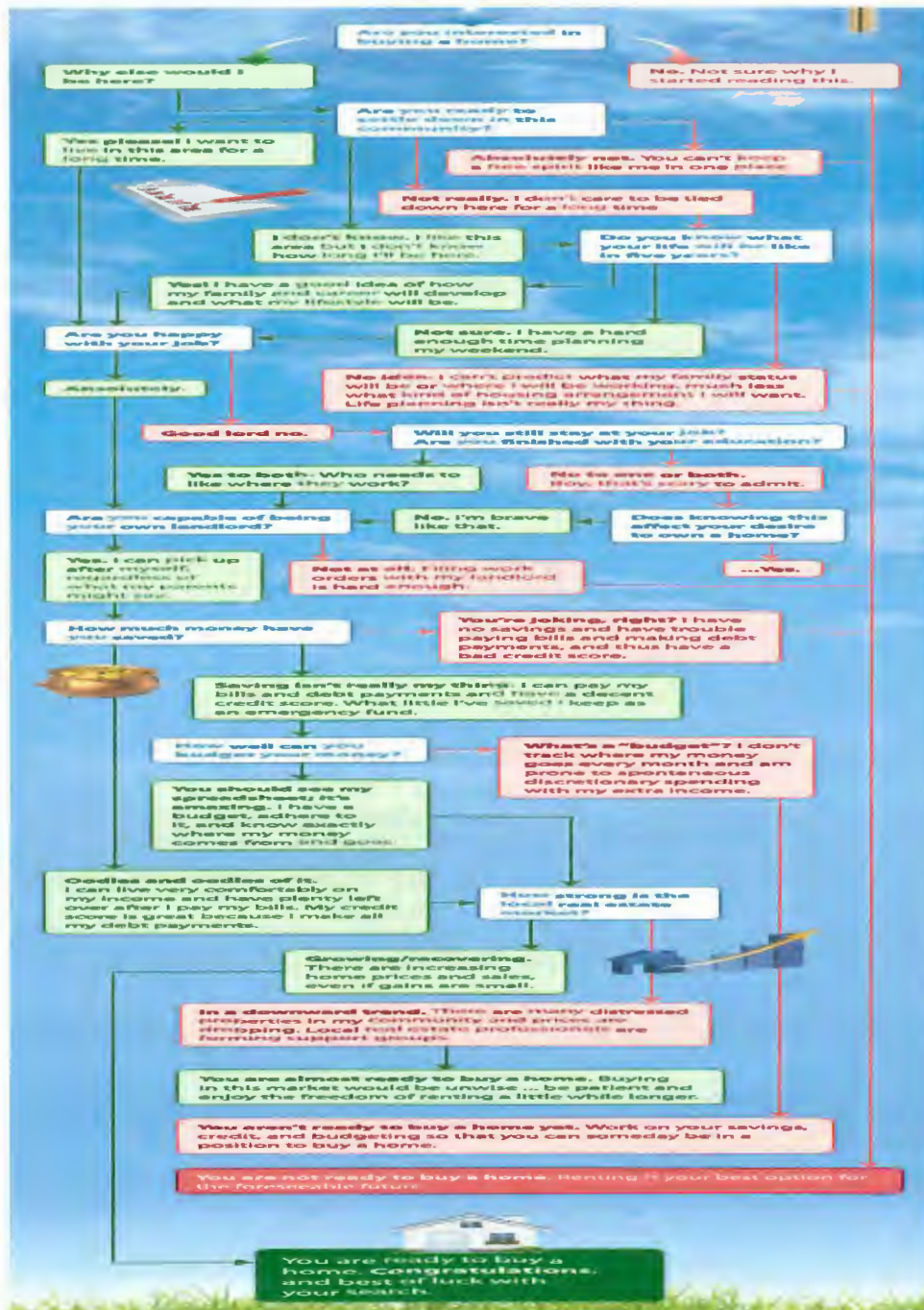


Figure 1 "Flowchart: Am I Ready to Buy A House?" Realstatecom Blog

2. Estimate How Much You Can Afford

Calculate the base price that is deemed to be affordable based on the financial assumption made from point “a”.

How much house can I afford?

DETAILS

Location
Los Angeles, CA

Marital Status
Single Married


Annual Income
\$ 75,000

Spouse Income
\$ 75,000

Down Payment
\$ 135,000

Monthly Debt Information
\$ 500

Credit Score
Very Good



You can afford a **\$743,000** home.

Why? Based on \$150,000 in annual income we believe you can comfortably afford a total monthly payment of \$3,921, which, including your other debt payments represents 36% of your income. To take a larger mortgage you will need more income.

Mortgage Payment	\$3,125	Mortgage Amount	\$608,000
Estimated Other Costs	\$796	Type	30 yr Fixed Agency Jumbo
Total Payment	\$3,921	Interest	3.625%
		APR	3.647%
Down Payment	\$135,000	Down Payment:	18.2%
Closing Costs	\$4,572	Minimum Down Payment is 15.8%	
Cash Reserve	\$11,764		
Recommended Savings	\$151,337		

MORTGAGE TYPE OPTIONS

30 YR FIXED 15 YR FIXED 5/1 ARM

HomePlus HomePlus Mortgage 30 yr Fixed Jumbo FHA **Visit Lender**
 NMLS: 78669 Rate: 3.25% | APR: 4.16% | Points: 0.55 Disclosure

3. Determine if you should keep on renting an apartment or buy a house

Renting an apartment vs. buying a house (based on assumptions stated under point “a” and the how much can you afford calculations above). A target price of 10% less than the \$743k amount from the “how much house can I afford” section has been chosen to leave some margin for any unexpected costs after the purchase of the house.

Rent Apartment vs. Buying a House	Change/addition in Assumptions:
Los Angeles, CA	Annual Home Value Increase 2%
Monthly Rent \$2500	Annual Maintenance on House 1.35%
Target Home Price 675,000	Annual Rental Increase 2%
Down Payment 20% - \$135,000	

If you stay in this house for 7 years, Buying is better than Renting.



YEAR 7	RENTING	COST DIFFERENCE	BUYING
MONTHLY COST	\$2,815	-\$516	\$3,332
TOTAL COST	\$223,028	\$2,558	\$220,470



The table below illustrates the breakdown of renting an apartment vs. buying a house over a period of 7 years. The home value below is higher than the initial price because a continuous appreciation of 2 – 4% and the yearly maintenance of 1.35% have been included in the final home value (after 7 years of ownership) below.

COST OF BUYING A HOUSE OVER 7 YEARS

COST OF RENTING OF APARTMENT OVER 7 YEARS

Home Equity	\$313,350	Rent	(\$223,028)
Home Value	\$775,363	Renter's Insurance	\$0
Mortgage Balance	(\$462,013)		
Upfront Expenses	(\$141,531)		
Down Payment	(\$135,000)		
Mortgage Fees	(\$775)		
Other Closing Costs	(\$5,756)		
Ongoing Expenses	(\$352,650)		
Mortgage Payment	(\$210,070)		
Mortgage Insurance	\$0		

Property Taxes	(\$40,211)		
Homeowner's Insurance	(\$25,592)		
Maintenance & Other Expenses	(\$76,777)		
Selling Expenses			
Closing Costs	(\$46,522)		
Capital Gains Tax	\$0		
Proceeds From Home Sale	\$266,828		
Tax Savings	\$61,171		
Lost Interest Income	(\$54,288)		
Total	(\$220,470)	Total	(\$223,028)

Renting an apartment vs. buying a condominium

The second comparison is made between renting an apartment vs. buying a condominium. On average, condos are 10 – 35% cheaper than a house, and hence, \$500k has been estimated as the target price for purchasing a condominium.

Renting an Apartment vs. Buying a Condominium	Assumptions:
Los Angeles, CA	Location CA 90025
Monthly Rent \$2500	Married 75K each
Target Home Price \$500,000	Monthly other debt \$500
Down Payment 20% - \$135000	Credit Score - Very Good
Marital Status - Married	Annual Homeowner Insurance 0.50
Annual Income \$75K each	Inflation 2%
HOA \$350	Annual Maintenance Fee 1.50%
	Annual Home Value Increase 1%

If you stay in this house for 8 years, Buying is better than Renting.



YEAR 8	RENTING	COST DIFFERENCE	BUYING
MONTHLY COST	\$2,872	\$37	\$2,835
TOTAL COST	\$257,489	\$47	\$257,442



COST OF BUYING A CONDOMINIUM OVER 8 YEARS

COST OF RENTING AN APARTMENT OVER 8 YEARS

Home Equity	\$208,755	Rent	(\$257,489)
Home Value	\$541,428	Renter's Insurance	\$0
Mortgage Balance	(\$332,673)		
Upfront Expenses	(\$105,480)		
Down Payment	(\$100,000)		
Mortgage Fees	(\$775)		
Other Closing Costs	(\$4,705)		
Ongoing Expenses	(\$330,444)		
Mortgage Payment	(\$177,840)		
Mortgage Insurance	\$0		
Property Taxes	(\$32,870)		
Homeowner's Insurance	(\$20,922)		
Maintenance & Other Expenses	(\$98,812)		
Selling Expenses			
Closing Costs	(\$32,486)		
Capital Gains Tax	\$0		

Proceeds From Home Sale	\$176,269		
Tax Savings	\$46,830		
Lost Interest Income	(\$44,617)		
Total	(\$257,442)	Total	(\$257,489)

Summary

Because the end user has a preference for a house over a condominium it has been determined (by the calculations above) that buying a house for roughly \$675k is more economical over renting an apartment if the buyer is planning on staying in that house for more than 7 years.

4. Get Your Credit Report

Retrieve your free credit score from the three bureaus below

AnnualCreditReport.com
The only source for your free credit reports. Authorized by Federal law.

Home All about credit reports Request yours now! What to look for Protect your identity Frequently asked questions Contact us

Spot identity theft early. Review your credit reports.
Suspicious activity or accounts you don't recognize can be signs of identity theft. Review your credit reports to catch problems early.
[Learn more about identity theft.](#)

PAUSE || SPOT IDENTITY THEFT GOOD CREDIT DON'T BE FOOLED MORE THAN A SCORE NOT LIKE THE OTHERS

Your credit reports matter.

- Credit reports may affect your mortgage rates, credit card approvals, apartment requests, or even your job application.
- Reviewing credit reports helps you catch signs of identity theft early.

[Request your free credit reports](#)

FREE Credit Reports. Federal law allows you to:

- Get a free copy of your credit report every 12 months from each credit reporting company
- Ensure that the information on all of your credit reports is correct and up to date.

BROUGHT TO YOU BY

 **Experian**

 **TransUnion**

 **EQUIFAX**

5. Research Loan Programs

Based on your "How much can you afford" calculation, your desired location, and your affordable down payment, calculate the interest rate that you would qualify for.

Mortgage Rates

Use SmartAsset's mortgage comparison tool to compare mortgage rates from the top banks and find the one that best suits you

DETAILS





Purchase or Refinance
 Purchase Refinance

Location
 90025

Target Home Price
 \$ 750,000

Down Payment
 20.00 % \$150,000

Credit Score
 Very Good

LOAN TYPE	PROPERTY TYPE	POINTS	FILTER RESULTS		
30 yr Fixed	Single Family	1 or less			
LENDER	APR/ RATE	MONTHLY PAYMENT	CLOSING COSTS	COST OVER 5 YEARS	
Sebonic Financial					
 Sebonic Financial	3.78% / 3.75%	\$2,778	\$2,070	\$168,750	Get Details
NMLS#: 66247 30 yr Fixed Conforming					
Crestline Funding					
 CRESTLINE FUNDING	4.00% / 4.00%	\$2,864	\$-402	\$171,438	Get Details
NMLS#: 1978 30 yr Fixed Conforming					
First Internet Bank					
 FIRST INTERNET BANK	3.83% / 3.75%	\$2,778	\$6,137	\$172,817	Get Details
NMLS#: 424182 30 yr Fixed Conforming					
HomePlus Mortgage					
 HomePlus	3.84% / 3.75%	\$2,778	\$6,300	\$172,980	Get Details
NMLS#: 78669 30 yr Fixed Conforming					
eRate Mortgage					
eRate Mortgage					

6. Get Mortgage Loan Preapproval

Get preapproved for any of the loans that you selected from above - preapproved buyers are preferred buyers since being preapproved demonstrates the seriousness of the potential buyer

7. Choose the Home You Want

Decide on the general layout of potential properties before the actual search

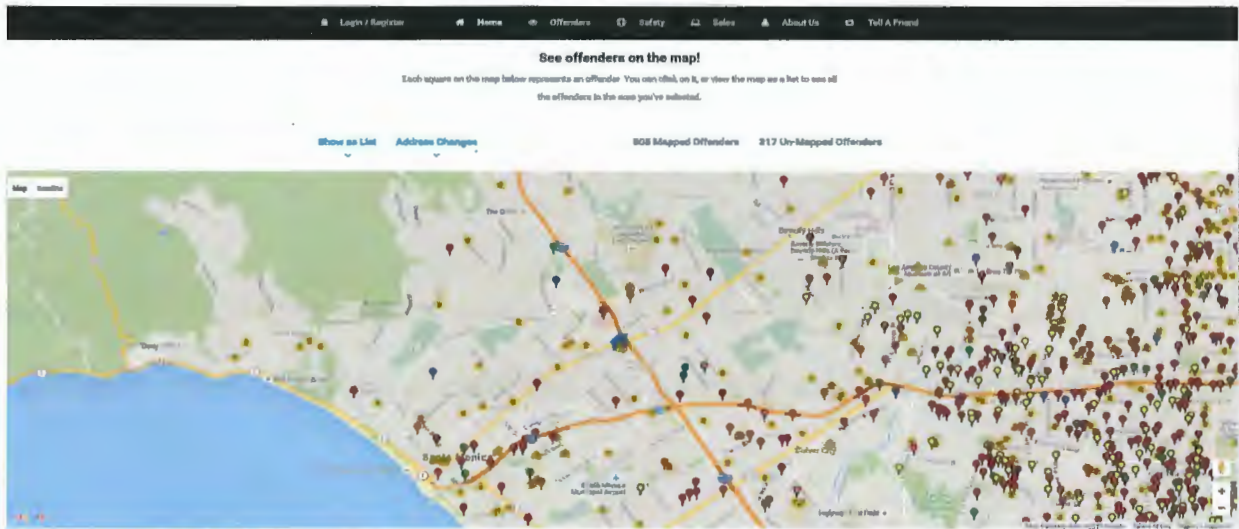


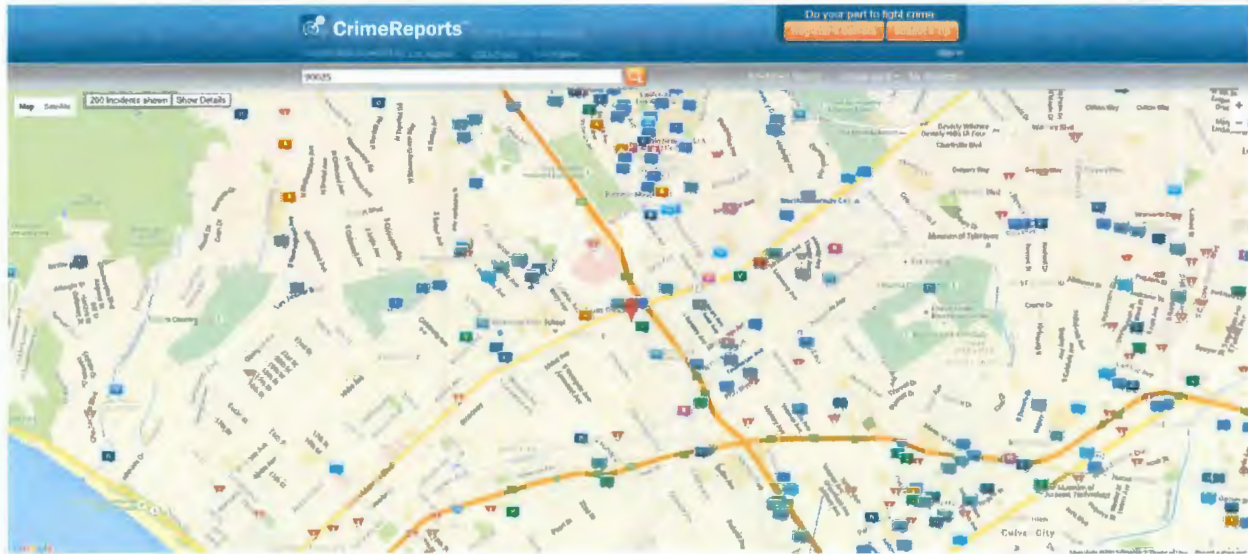
Contemporary Style

It has been determined that a 2 bedroom and 1 ½ bathrooms property is the ideal layout for the couple of 2.

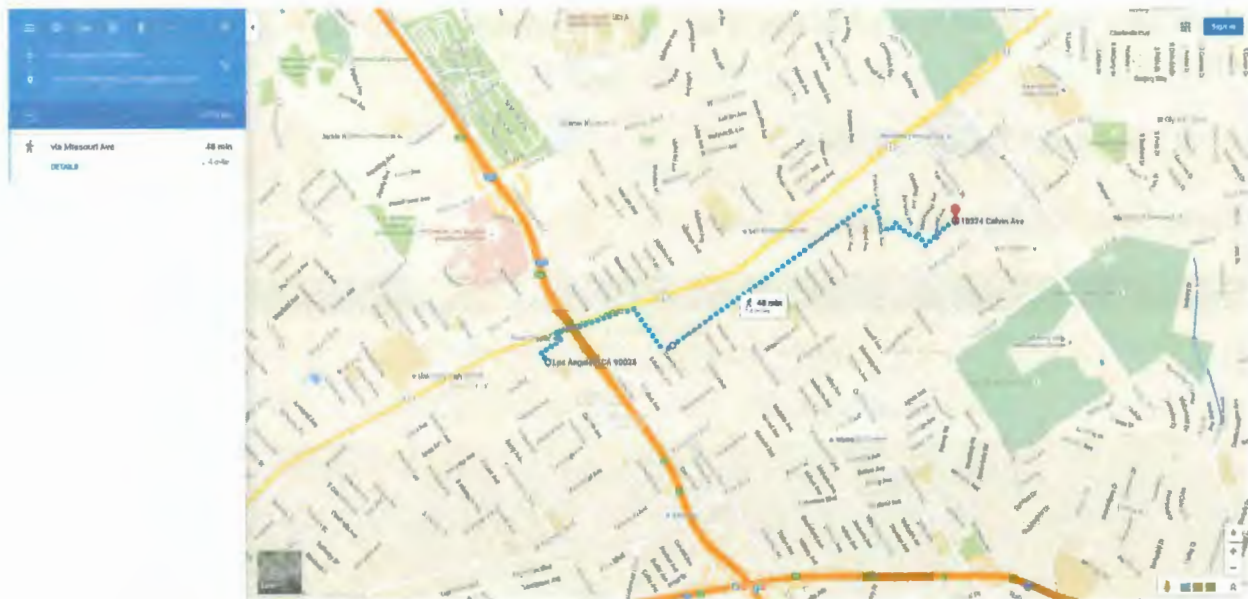
8. Research Neighborhoods

Crime based statistics in the desired area:





Walk the neighborhood (as stated in the assumptions - CA 90025)



It has been determined that the area of interest (CA 90025) has a relatively low crime percentage and is very walkable.

9. Look at Real Estate Listings

Utilize the common online outlets (Trillian, Zillow...) for your preliminary online search for potential properties within your price range and area. As indicated in the graph below, there are no houses available for less than 750k within the 90025 zip code. Because of this, the search radius has been increased by 1 Mile of the desired location.

The screenshot shows the Zillow website interface for Los Angeles. At the top, there are navigation links: Buy, Rent, Sell, Mortgages, Agent finder, Advice, Home design, More. On the right, there are links for Advertise, Sign in or join. The search bar shows 'Los Angeles' and filters for 'FOR SALE', 'UP TO \$900K', '4+ BEDS', 'HOME TYPE (1)', and 'MORE (1)'. Below the search bar is a map of Los Angeles with red dots representing properties for sale. On the right side of the map, there is a sidebar with the following content:

- Los Angeles CA Single Family Homes**
53 results.
- Featured **Newest** More
- 5731 Lexington Avenue, Los Angeles, CA**
HOUSE FOR SALE
\$849,000
3 bds • 3 ba
Less than 1 day on Zillow
- 5277 Blackwelder St, Los Angeles, CA**
COMING SOON
\$399,900
3 bds • 1 ba • 804 sqft
On market Nov 20th
- 4719 W 30th St, Los Angeles, CA**
HOUSE FOR SALE
\$399,000
2 bds • 1 ba • 924 sqft
On market Nov 20th

10. Talk to Neighbors

Spend time in the front yard of your potential new neighborhood (face to face communication) to learn about your potential neighbors.



11. Find a Real Estate Agent

The screenshot shows the realtor.com website interface. At the top, there are navigation links for BUY, RENT, MORTGAGE, find REALTORS®, LOCAL, and NEWS & ADVICE. Below the navigation, the search criteria are displayed: "Your Search Criteria 90025 Agent". The search results show "1424 REALTORS® found" and "90025 Real Estate Agents and Brokers". The results are sorted by "First Name, A to Z".

On the left side, there are several utility links and a "What can I afford in 90025?" section. The "What can I afford in 90025?" section includes a "Change Location" link, a "Get your FREE home value report" button, and radio buttons for "Single Family Home" and "Condo/Townhouse". Below this is a "Get Ready To Move" section with links for "Get up to 4 free moving quotes", "Tips about finding your first home", "Boxes & Packing Supplies", and "Manage Your Move with the Moving.com® Move Planner".

The search results list four agents:

- A Corey Angel Broker/Owner Agent**: CAPS Realty, Office: (323) 544-5514, View full profile
- Asiya Lodmila, Real Estate Consultant Agent**: Inero Real Estate Services, Office: (310) 770-0007, View full profile
- Aaron Mirsky Agent**: Gibson International, Mobile: (310) 270-7548, Office: (310) 622-7427, Fax: (310) 820-0223, View full profile
- Abe Soleimani Agent**: Coldwell Banker Residential Brokerage - Beverly Hills North, Office: (310) 777-0260, Fax: (310) 278-7192, View full profile

12. Determine Contingencies

Check if there are any contingencies on the house or if any contingencies should be implemented in the contract. An example of that would be an appraisal contingency - giving the buyer the opportunity to cancel the purchase agreement if the home does not appraise for the purchase price.

13. Hire a Home Inspector

When selecting a home inspector make sure that he/she also includes step 14 of the action list - Check for Unpaid Property Taxes, Liens

The Best 10 Home Inspectors in Los Angeles, CA

Showing 1-10 of 595

Businesses Home Services Home Inspectors

Filters

⌵ \$\$\$ \$\$\$\$ Open Now Offering a Deal Accepts Credit Cards All Filters

Ad **DNZ Home Inspections** (1)
Serving Van Nuys and the Surrounding Area
(818) 679-9553
★★★★★ 2 reviews
Home Inspectors

We are greater Los Angeles area premier home inspection company, offering the most comprehensive real estate inspection report in the industry, backed by a 90 day home warranty, and a recall...

Ad **David Home Inspection and Mold Testing** (1)
Serving Chino and the Surrounding Area
(844) 344-4968
★★★★★ 254 reviews
Home Inspectors

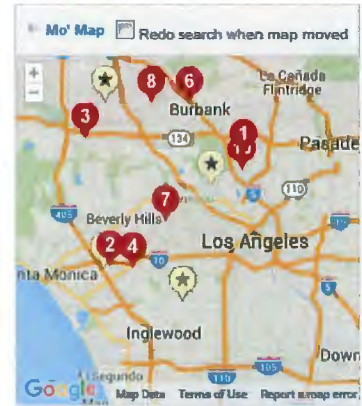
Hey I wanted to give an update to my review from last year. I used Chris Hutchins and his associate George once again on a new property, and they did a killer job. On time, thorough, and...

1. Advanced Group Property Inspections
Serving Glendale and the Surrounding Area
(818) 247-7771
★★★★★ 118 reviews
Home Inspectors

Somebody recommended me this company and even I have not worked with them I will contact them if my go to guy is not available. Thank you.

2. RELIANCE Home Inspections
Palms
Los Angeles, CA 90034
(310) 572-4500
★★★★★ 33 reviews
Home Inspectors

I was extremely pleased with my experience with Reliance Home Inspections. George is a professional and took great care inspecting our home. Reliance Home Inspections are the people you want...



Ads (1)

Common Sense Inspections
★★★★★ 37 reviews
Mau R. - Thank you fellow Yelpers who pointed me in Samuel's direction. Samuel was...
[read more](#)

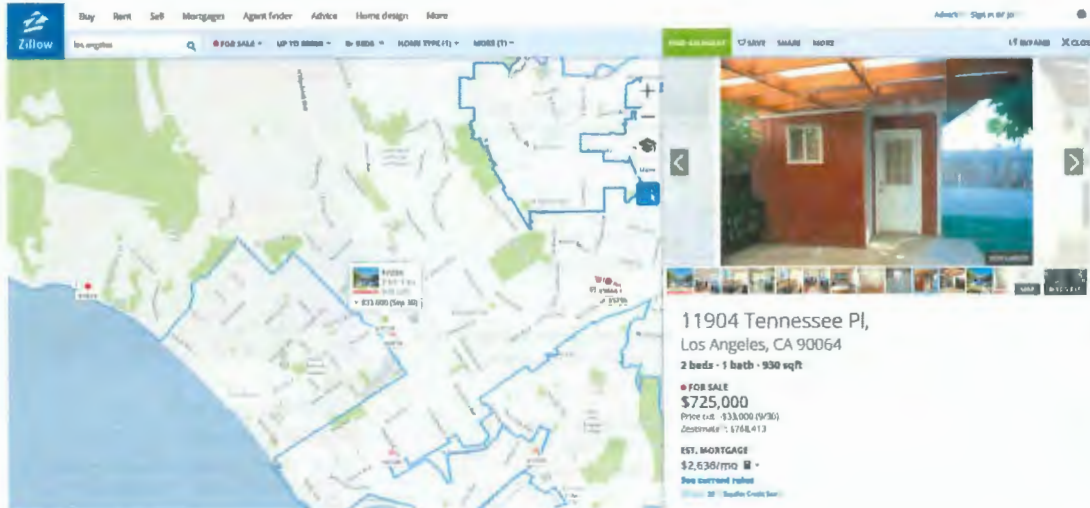
Aardvark Property Hazard Analysis
★★★★★ 27 reviews
Mary A. - Frank the owner is extremely honest i have used him to test two properties...
[read more](#)

14. Check for Unpaid Property Taxes, Liens

This step has been implemented to check for unpaid property taxes and liens. This is also one of the reasons why it is recommended to use a real estate agent since they usually check this automatically for the buyer.

15. Get the Home Appraised

For demonstration purposes, the house below has been selected. Make sure that the appraisal estimates that price at 725k or above.



Select a State agency that licenses appraiser:



16. Make Purchase Funds Available

Make purchase funds available by selling investments and other property .

17. Complete Final Walk-Through

Perform your last inspection before the final step - closing.



18. Closing

Sign all the required documents for the final closing.



Conclusion on verification and validation:

After demonstrating the functionality of the 18 Step Guide above it has been determined that both verification and validation have been completed to the satisfaction of the customer. As mentioned under step 8 of the verification and validation example above, no house could be found for less than 750k within the 90025 zip code. The conclusion is that a couple with the assumed financial situation as mentioned above could not safely afford a house within the CA 90025 zip code. Because of this, the guide concluded that the next best alternative would be a house approximately 1 Mile west of the desired location. This decision would be financially feasible if the couple plans on staying in this house for more than seven years in comparison to renting an apartment for seven years. Following the 18 Steps Guide greatly reduces the likelihood of a foreclosure due to the many carefully designed decision gates presented in this guide. These gates are implemented to educate the first time homebuyer while also assuring that the potential buyer is ready to advance through each step to successfully buy a property within his/her means.