

City of Arnold, Missouri

**Work Session
Council Chambers**

**December 08, 2016
7:00 p.m.**

Agenda

1. Melody Lane Project
2. New Subdivision Traffic Studies
3. Old Lemay Ferry Pavement Restriping
4. Adjournment

November 29, 2016

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HR HURST-ROSCHE ENGINEERS, INC.

PROJECT: City of Arnold - Melody Lane & Key West Dr
 COMPUTATIONS FOR: Home Appraisals Estimate
 JOB CODE: 845-2636

SHEET NO.: _____ OF: _____
 DESIGNED: MEB DATE: 11/16/16
 CHECKED: ZAY DATE: 11/16/16

Address	Jefferson County Property Info.			Est. Markup	
	Tax Appraisal Value	Assessment Level	Market Value	20%	Fair Market Value Est.
1815 Melody Lane	\$ 13,300.00	19%	\$ 70,000.00	\$ 14,000.00	\$ 84,000.00
1829/1831 Melody Lane	\$ 19,500.00	19%	\$ 102,631.58	\$ 20,526.32	\$ 123,157.89
1910 Melody Lane	\$ 14,600.00	19%	\$ 76,842.11	\$ 15,368.42	\$ 92,210.53
1885 Key West Drive	\$ 12,500.00	19%	\$ 65,789.47	\$ 13,157.89	\$ 78,947.37
1940 Key West Drive	\$ 9,900.00	19%	\$ 52,105.26	\$ 10,421.05	\$ 62,526.32
			\$ 367,368.42		\$ 440,842.11



Jefferson County, Missouri

Est. 1818



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Real Estate Information

Property Tax Credit

Real Estate Information

How is my real estate value determined?

Jefferson County, as with most counties in Missouri, primarily values real estate for tax purposes using mass appraisal methodology. This method first determines the current replacement cost of all improvements, less any depreciation of those improvements. The depreciated value of these improvements is added to the value of the land to determine the fair market value of the property. The mass appraisal method is recognized as being one of the most efficient and fair methods of valuing many properties over a wide area.

When is my property reassessed?

State law requires all real property to be reassessed each odd numbered year. Reassessment does not necessarily mean the value of property will increase or decrease. Information and data pertaining to real estate values and costs are collected by the Assessor's Office. Analysis and studies are performed to determine how the real estate market has changed and how it has affected assessed values. The conclusions determined from the data collected are used to determine if any changes are made to real estate values of the current reassessment year.

What is market value and assessed value?

A simple definition of market value is the price the property would bring when offered for sale by a person who is willing but not obligated to sell it, and is bought by a person who is willing to purchase it but who is not forced to do so. Assessed value is a percentage of the market value based upon the classification, which is determined by the type of property or how it is used. By state statute the Missouri Legislature has set three classifications of real property and the assessment level for each. The classifications and assessment levels for each are: Commercial real property at 32%, Residential real property at 19% and Agricultural real property at 12%.

For example:

$\$100,000 \text{ market value} \times 19\% \text{ residential assessment level} = \$19,000 \text{ assessed value}$

Why would my assessment or taxes increase?

There are several factors that can affect the assessed value or taxes other than reassessment. Some of the things that could affect the assessed value are: physical changes to the property such as an addition or other new construction, the previous value may have been a prorated value based upon the date of occupancy and the new value reflects the full year value or additional acreage may have been added to the real estate parcel.

The actual tax amount may also change from year to year without any change to your assessed value. The tax rate applicable to your property may change, thus resulting in a change to your tax amount. Your tax rate is determined by a combination of levies for the school, fire, ambulance and other taxing entities that apply to your property. These levies can be changed by either the entities or by voter approval. If the tax rate increases then your taxes may increase with no change to your assessed value.

Is there an appeal process? If you feel the Assessor's value does not reflect the fair market value of your property first call the Assessor's Office. They will review the information in your file with you and examine any information pertaining to the value you wish to present. After discussing the value of your property with the Assessor's Office and you are not satisfied, you can file an appeal before the Board of Equalization (BOE). The appeal must be filed before the second Monday in July of each year. To file an appeal you must contact the County Clerk's Office at (636) 797-5478.

If you are not satisfied with the Board of Equalization decision you may further appeal to the Missouri State Tax Commission. Information will be provided to you by the County Clerk's Office.

Destroyed Residential Property

Section 137.082, RSMo allows the assessor to remove the value of residential property, on a pro rata basis, which was destroyed by a natural disaster such as a tornado, flood, fire, or earthquake. The following claim form must be completed in order to received such a

Site Addresses

House Number 1815	House Number Suffix	Street Name MELODY LN	
City ARNOLD	State MO	Zip Code 63010	Location

Land Valuation

Property Use	Valued Acres	Appraised Value
Residential	0.2000	8800.00

One Story Structure (1 of 1)

Property Type	Description	Total Area (sq. ft.)	Year Built
RES - Residential	One Story	950	1968
Base Cost (Square Ft.) Parcel 01-4.0-19.0-3-006-003.			
Masonry Construction	950		
Occupancy (Quantity) Parcel 01-4.0-19.0-3-006-003.			
Dwelling			
Addition (Square Ft.) Parcel 01-4.0-19.0-3-006-003.			
Frame Addition	275		
Heating/Cooling (Square Ft.) Parcel 01-4.0-19.0-3-006-003.			
Central Air	950		

Assessments

Assessment Period	Appraised Land	Assessed Land	Appraised Building	Assessed Building	Appraised Total	Assessed Total
Final Value	8,800	1,700	61,200	11,600	70,000	13,300
Form 11a	8,800	1,700	61,200	11,600	70,000	13,300
Form 11	8,800	1,700	61,200	11,600	70,000	13,300
Prior Year	8,800	1,700	61,200	11,600	70,000	13,300

Taxing Bodies

District	Tax Rate	Extension
ROCK AMBULANCE	0.2087	\$27.76
CITY OF ARNOLD	0.4003	\$53.24
JEFFERSON COLLEGE	0.3406	\$45.30
COUNTY TAX	0.0000	\$0.00
ROCK COMM FIRE	0.7632	\$101.51
HEALTH UNIT TAX	0.1109	\$14.75
LIBRARY / C1 & C6	0.1764	\$23.46
MENTAL HEALTH TAX	0.0940	\$12.50
PARK TAX	0.0280	\$3.72
ROAD & BRIDGE TAX	0.1987	\$26.43
FOX SCHOOL	4.6499	\$618.44
JC DEV DISABILITIES	0.0940	\$12.50
STATE TAX	0.0300	\$3.99
Total	7.0947	\$943.60

Site Addresses

House Number 1829	House Number Suffix	Street Name MELODY LN	
City ARNOLD	State MO	Zip Code 63010	Location
House Number 1831	House Number Suffix	Street Name MELODY LN	
City ARNOLD	State MO	Zip Code 63010	Location

Land Valuation

Property Use	Valued Acres	Appraised Value
Residential	0.1700	8800.00

One Story Structure (1 of 1)

Property Type	Description	Total Area (sq. ft.)	Year Built
RES - Residential	One Story	784	1970
Base Cost (Square Ft.) Parcel 01-4.0-19.0-3-006-001.			
Masonry Construction	784		
Occupancy (Quantity) Parcel 01-4.0-19.0-3-006-001.			
Dwelling			
Carport (Square Ft.) Parcel 01-4.0-19.0-3-006-001.			
Carport	288		

Assessments

Assessment Period	Appraised Land	Assessed Land	Appraised Building	Assessed Building	Appraised Total	Assessed Total
Final Value	8,800	1,700	93,900	17,800	102,700	19,500
Form 11a	8,800	1,700	93,900	17,800	102,700	19,500
Form 11	8,800	1,700	93,900	17,800	102,700	19,500
Prior Year	8,800	1,700	93,900	17,800	102,700	19,500

Taxing Bodies

District	Tax Rate	Extension
ROCK AMBULANCE	0.2087	\$40.70
CITY OF ARNOLD	0.4003	\$78.06
JEFFERSON COLLEGE	0.3406	\$66.42
COUNTY TAX	0.0000	\$0.00
ROCK COMM FIRE	0.7632	\$148.82
HEALTH UNIT TAX	0.1109	\$21.63
LIBRARY / C1 & C6	0.1764	\$34.40
MENTAL HEALTH TAX	0.0940	\$18.33
PARK TAX	0.0280	\$5.46
ROAD & BRIDGE TAX	0.1987	\$38.75
FOX SCHOOL	4.6499	\$906.73
JC DEV DISABILITIES	0.0940	\$18.33
STATE TAX	0.0300	\$5.85
Total	7.0947	\$1,383.48

Site Addresses

House Number 1910	House Number Suffix	Street Name MELODY LN	
City ARNOLD	State MO	Zip Code 63010	Location

Land Valuation

Property Use Residential	Valued Acres 0.3100	Appraised Value 9900.00
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One Story Structure (1 of 1)

Property Type RES - Residential	Description One Story	Total Area (sq. ft.) 1,148	Year Built 1963
Base Cost (Square Ft.) Parcel 01-4.0-19.0-4-010-033.			
Masonry Construction	1148		
Occupancy (Quantity) Parcel 01-4.0-19.0-4-010-033.			
Dwelling			
Heating/Cooling (Square Ft.) Parcel 01-4.0-19.0-4-010-033.			
Central Air	1148		
Porches (Square Ft.) Parcel 01-4.0-19.0-4-010-033.			
Open Frame Porch	36		
Attached/Integral Garage (Square Ft.) Parcel 01-4.0-19.0-4-010-033.			
Frame Construction	251		
Shed (Square Ft.) Parcel 01-4.0-19.0-4-010-033.			
Frame Shed	24		

Assessments

Assessment Period	Appraised Land	Assessed Land	Appraised Building	Assessed Building	Appraised Total	Assessed Total
Final Value	9,900	1,900	66,800	12,700	76,700	14,600
Form 11a	9,900	1,900	66,800	12,700	76,700	14,600
Form 11	9,900	1,900	66,800	12,700	76,700	14,600
Prior Year	9,900	1,900	66,800	12,700	76,700	14,600

Taxing Bodies

District	Tax Rate	Extension
ROCK AMBULANCE	0.2087	\$30.47
CITY OF ARNOLD	0.4003	\$58.44
JEFFERSON COLLEGE	0.3406	\$49.73
COUNTY TAX	0.0000	\$0.00
ROCK COMM FIRE	0.7632	\$111.43
HEALTH UNIT TAX	0.1109	\$16.19
LIBRARY / C1 & C6	0.1764	\$25.75
MENTAL HEALTH TAX	0.0940	\$13.72
PARK TAX	0.0280	\$4.09
ROAD & BRIDGE TAX	0.1987	\$29.01
FOX SCHOOL	4.6499	\$678.89
JC DEV DISABILITIES	0.0940	\$13.72
STATE TAX	0.0300	\$4.38
Total	7.0947	\$1,035.82

Site Addresses			
House Number 1885	House Number Suffix	Street Name KEY WEST DR	
City ARNOLD	State MO	Zip Code 63010	Location

Land Valuation		
Property Use	Valued Acres	Appraised Value
Residential	0.1800	9900.00

One Story Structure (1 of 1)			
Property Type	Description	Total Area (sq. ft.)	Year Built
RES - Residential	One Story	962	1967
Base Cost (Square Ft.) Parcel 01-4.0-19.0-4-010-005.			
Frame Construction	962		
Occupancy (Quantity) Parcel 01-4.0-19.0-4-010-005.			
Dwelling			
Masonry Trim (Square Ft.) Parcel 01-4.0-19.0-4-010-005.			
Brick (Average)	296		
Heating/Cooling (Square Ft.) Parcel 01-4.0-19.0-4-010-005.			
Central Air	962		
Porches (Square Ft.) Parcel 01-4.0-19.0-4-010-005.			
Open Frame Porch	76		
Attached/Integral Garage (Square Ft.) Parcel 01-4.0-19.0-4-010-005.			
Frame Construction	312		

Assessments						
Assessment Period	Appraised Land	Assessed Land	Appraised Building	Assessed Building	Appraised Total	Assessed Total
Final Value	9,900	1,900	55,700	10,600	65,600	12,500
Form 11a	9,900	1,900	55,700	10,600	65,600	12,500
Form 11	9,900	1,900	55,700	10,600	65,600	12,500
Prior Year	9,900	1,900	55,700	10,600	65,600	12,500

Taxing Bodies		
District	Tax Rate	Extension
ROCK AMBULANCE	0.2087	\$26.09
CITY OF ARNOLD	0.4003	\$50.04
JEFFERSON COLLEGE	0.3406	\$42.58
COUNTY TAX	0.0000	\$0.00
ROCK COMM FIRE	0.7632	\$95.40
HEALTH UNIT TAX	0.1109	\$13.86
LIBRARY / C1 & C6	0.1764	\$22.05
MENTAL HEALTH TAX	0.0940	\$11.75
PARK TAX	0.0280	\$3.50
ROAD & BRIDGE TAX	0.1987	\$24.84
FOX SCHOOL	4.6499	\$581.24
JC DEV DISABILITIES	0.0940	\$11.75
STATE TAX	0.0300	\$3.75
Total	7.0947	\$886.85

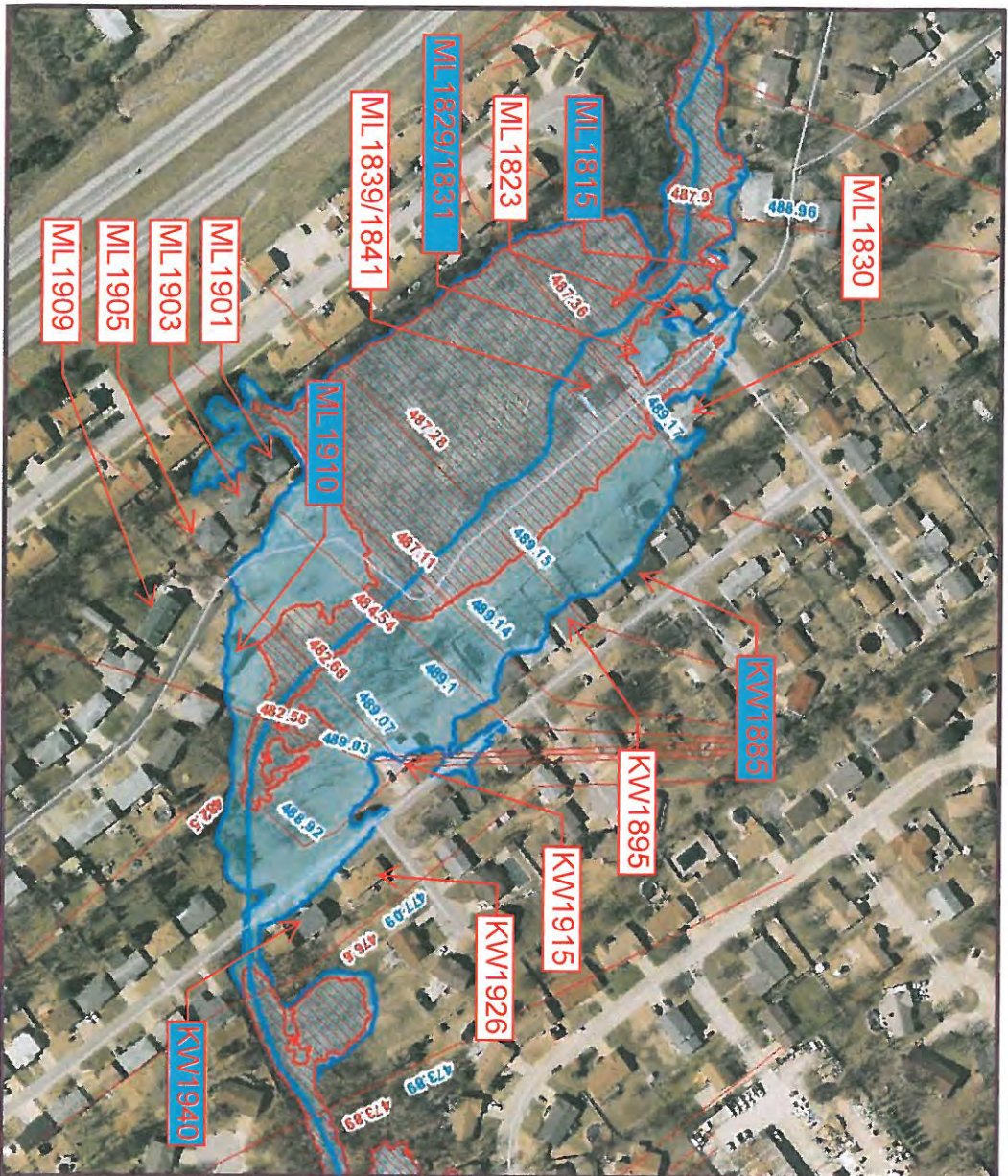
Site Addresses			
House Number 1940	House Number Suffix	Street Name KEY WEST DR	
City ARNOLD	State MO	Zip Code 63010	Location

Land Valuation		
Property Use Residential	Valued Acres 0.1600	Appraised Value 9900.00

Split Level Structure (1 of 1)			
Property Type RES - Residential	Description Split Level	Total Area (sq. ft.) 960	Year Built 1987
Base Cost (Square Ft.) Parcel 01-4.0-19.0-4-009-044.04			
Frame Construction	960		
Occupancy (Quantity) Parcel 01-4.0-19.0-4-009-044.04			
Dwelling			
Addition (Square Ft.) Parcel 01-4.0-19.0-4-009-044.04			
Frame Addition	42	Frame Addition	44
Masonry Trim (Square Ft.) Parcel 01-4.0-19.0-4-009-044.04			
Brick (Average)	126		
Heating/Cooling (Square Ft.) Parcel 01-4.0-19.0-4-009-044.04			
Central Air	960		
Foundation Adjustments (Square Ft.) Parcel 01-4.0-19.0-4-009-044.04			
Unfinished Basement Area	546		
Attached/Integral Garage (Square Ft.) Parcel 01-4.0-19.0-4-009-044.04			
Integral Garage - Below Grade	480		

Assessments						
Assessment Period	Appraised Land	Assessed Land	Appraised Building	Assessed Building	Appraised Total	Assessed Total
Final Value	9,900	1,900	42,000	8,000	51,900	9,900
Form 11a	9,900	1,900	42,000	8,000	51,900	9,900
Form 11	9,900	1,900	42,000	8,000	51,900	9,900
Prior Year	9,900	1,900	42,000	8,000	51,900	9,900

Taxing Bodies		
District	Tax Rate	Extension
ROCK AMBULANCE	0.2087	\$20.66
CITY OF ARNOLD	0.4003	\$39.63
JEFFERSON COLLEGE	0.3406	\$33.72
COUNTY TAX	0.0000	\$0.00
ROCK COMM FIRE	0.7632	\$75.56
HEALTH UNIT TAX	0.1109	\$10.98
LIBRARY / C1 & C6	0.1764	\$17.46
MENTAL HEALTH TAX	0.0940	\$9.31
PARK TAX	0.0280	\$2.77
ROAD & BRIDGE TAX	0.1987	\$19.67
FOX SCHOOL	4.6499	\$460.34
JC DEV DISABILITIES	0.0940	\$9.31
STATE TAX	0.0300	\$2.97
Total	7.0947	\$702.38



Blue Line – FEMA approved 100yr Floodplain. Red Line Area is to be ignored

CALLOUT LEGEND

Check Valves Recommended

Home Buyout Recommended

ML = Melody Lane

KW = Key West Drive

Melody Lane/Key West Flood Elevations

Address	Type of House	Basement	Basement Floor	Main Floor	Attached Garage	Lowest Adjacent Grade	Flood Elevation	Homeowner Notes	Additional Notes	Flooding Potential
1946 Key West	Split Foyer	Basement assumed 6" above Garage	489.88	493.61	489.38		488.92		Split Level Condemned	Flooding is unlikely, the garage is constructed 0.46-ft or approximately 6-in above the 100-yr event
1941 Key West	Ranch w/ basement	Walkout Basement, FF Assumed (9" above Basement)	489.41	497.83			488.92			Basement is below 100-yr floodplain, however ground around home is above 100-yr event. Could be a candidate for sewer check valve.
1940 Key West	Split Foyer	Basement assumed 6" above Garage	488.86	492.59	488.56		488.92	When street floods water enters garage, home has sewer issues and ground is eroding under house.		Flooding is anticipated in garage and basement for the 100-yr event.
1926 Key West	Ranch w/ basement	Basement Elevation Assumed (9" below FF)	481.84	490.84	489.34		488.92	Basement floods, had basement sealed and added sump pump.	Rear of home is lower than front, but backyard drains to Muddy Creek	Basement is below floodplain. Could be a candidate for sewer check valve.
1915 Key West	Ranch w/ basement	Basement Elevation Assumed (9" below FF)	483.80	492.80			489.03	No flooding issue. No walkout basement.	TBM Top of curb 489.76	Basement is below floodplain. Could be a candidate for sewer check valve. Property owner indicated they haven't experience flooding.
1903 Key West	Ranch w/ basement	Basement Elevation Assumed (9" below FF)	483.78	492.78			489.10	No flooding issue. No walkout basement.	Street floods.	Basement is below floodplain. Could be a candidate for sewer check valve. Property owner indicated they haven't experience flooding.
1895 Key West	Ranch w/ basement	Basement Elevation Assumed (9" below FF)	484.36	493.36			489.14	No walkout		Basement is below floodplain. Could be a candidate for sewer check valve.
1891 Key West	Split Foyer	Walkout Basement	491.69				489.15	No flooding issues	Conc. patio 489.22	Flooding is unlikely as the walkout basement is 2.54-ft above the 100-yr event.
1885 Key West	Ranch w/ basement	Walkout Basement, FF Assumed (9" above Basement)	488.65	497.55			489.15			Flooding is anticipated in basement as the ground elevation in the backyard is almost 0.6-ft below the 100-yr event.
1881 Key West	Ranch w/ basement	Walkout Basement, FF Assumed (9" above Basement)	489.29	498.29			489.15	Flooding in house during heavy rain.	Low point near house 489.00.	Flooding is unlikely as the walkout basement is 0.14-ft or approximately 2-in above the 100-yr event.
1879 Key West	Split Foyer	Walkout Basement, FF Assumed (9" above Basement)	493.14	502.14			489.17	No issues. Just ditch flooding.		Walkout Basement is approximately 4-ft above the 100-yr floodplain and therefore is unlikely to flood.
1873 Key West	Ranch w/ basement	Walkout Basement, FF Assumed (9" above Basement)	490.89	499.89			489.17	No issues.		Walkout Basement is approximately 1.7-ft above the 100-yr floodplain and therefore is unlikely to flood.
1869 Key West	Ranch w/ basement	Basement Elevation Assumed (9" below FF)	492.60	501.60			489.17	No issues.	Conc. Patio FF 493.39	Flooding is unlikely, the garage is constructed 0.46-ft or approximately 6-in above the 100-yr event.
1916 Melody Lane	Ranch w/ basement	Walkout Basement, FF Assumed (9" above Basement)	493.42				488.92	No issues.		Flooding is unlikely, the garage is constructed 0.46-ft or approximately 6-in above the 100-yr event.
1915 Melody Lane	Ranch w/ basement	Walkout Basement, FF Assumed (9" above Basement)	499.35	508.35			489.03	No issues.	Conc. Drive 499.03	Walkout Basement is approximately 10" above 100-yr floodplain.

Melody Lane/Key West Flood Elevations

Address	Type of House	Basement	Basement Floor	Main Floor	Attached Garage	Lowest Adjacent Grade	Flood Elevation AMEC Study	Homeowner Notes	Additional Notes	Flooding Potential
1910 Melody Lane	Ranch w/ basement	Walkout Basement, FF Assumed (9' above Basement)	486.07	495.87		486.70	488.92	Sewer backups.	Back Patio 486.70	2.5-ft of flooding thru walkout basement is expected under a 100-yr event. Homeowner has reported sewer backup issues.
1909 Melody Lane	Ranch w/ basement	Walkout Basement, FF Assumed (9' above Basement)	490.66	499.66		490.50	489.07	Sewer backups.	Back Patio 490.50	Walkout Basement is approximately 1.5-ft above the 100-yr flood elevation and therefore is unlikely to flood. Homeowner has reported sewer backup issues. Could be a candidate for sewer check valve.
1905 Melody Lane	Ranch, w/ basement	Basement Elevation Assumed (9' below FF)	486.07	495.07		491.33	489.07	Sewer backups.	Basement Window Sill 492.65	Basement is below floodplain. Homeowner has reported sewer backup issues. Could be a candidate for sewer check valve.
1903 Melody Lane	Ranch, basement unknown?	Basement Elevation Assumed (9' below FF)	484.83	493.83		490.33	489.1	Sewer backups.	Basement Window Sill 491.04	Basement is below floodplain. Homeowner has reported sewer backup issues. Could be a candidate for sewer check valve.
1901 Melody Lane	Ranch, basement unknown?	Basement Elevation Assumed (9' below FF)	485.06	494.06		490.33	489.1	No issues, no walkout.	Basement Window Sill 491.16	Basement is below floodplain. Could be a candidate for sewer check valve.
1839-1841 Melody Lane	Duplex	No Basement		490.58		487.83	489.17			Finished Floor Elevation is approximately 0.6-ft or 7-in above the 100-yr floodplain. The road and property around the duplex will be flooded during a 100-yr storm.
1830 Melody Lane	Ranch w/ basement	Basement Elevation Assumed (9' below FF)	483.41	492.41		491.09	489.17	Stormwater backup through sump pump.		Basement is below floodplain. Homeowner indicates some backup thru the sump pump. Could be a candidate for sewer check valve.
1829 Melody Lane	Duplex, basement foundation wall exposed along carport.	Basement Elevation Assumed (9' below FF)	484.59	493.59		487.59	489.17			Duplex finished floor elevation was not shot, the low ground elevation in the carport adjacent to the basement foundation was shot and is 1.58-ft below the 100-yr floodplain. This elevation appears to be 6-ft below the finished floor elevation based on the number of steps to the finished floor.
1823 Melody Lane	Split Foyer	Basement assumed 6" above Garage	489.84		489.34	489.30	489.17			Garage elevation is 0.17-ft above the 100-yr flood elevation or almost 2". This is a split foyer home with the basement elevation approximately 6" above the garage elevation and therefore the basement is not as likely to flood.
1815 Melody Lane	Ranch w/ basement	Walkout Basement	488.88				489.17	Property has identified flooding thru walkout basement (flooding is shown in photo below)		Flooding is anticipated in basement. The walkout basement is 0.52-ft below the 100-yr floodplain.
1805 Melody Lane	Ranch w/ basement	Walkout Basement	491.06							Flood Elevation not covered in AMEC Study
1801 Melody Lane	Ranch w/ basement	Walkout Basement	491.56							Flood Elevation not covered in AMEC Study
1765 Melody Lane	Ranch w/ basement	Walkout Basement, FF Assumed (9' above Basement)	492.97	501.97				No issues.		Flood Elevation not covered in AMEC Study

City of Arnold CALC: MEB DATE: 11/03/16
 Job No. 845-2936 CHECKED: ZAY DATE:

Melody Lane/Key West Flood Elevations

Address	Type of house	Basement	Basement Floor	Main Floor	Attached Garage	Lowest Adjacent Grade	Flood Elevation Amec Study	Homeowner Notes	Additional Notes	Flooding Potential
1761 Melody Lane	Split Foyer	Walkout Basement	492.82							Flood Elevation not covered in AMEC Study
1757 Melody Lane	Split Foyer	Walkout Basement	496.09							Flood Elevation not covered in AMEC Study
1753 Melody Lane	Split Foyer	Walkout Basement	496.47							Flood Elevation not covered in AMEC Study
1749 Melody Lane	Split Foyer	Walkout Basement	498.24							Flood Elevation not covered in AMEC Study
1745 Melody Lane	Split Foyer	Walkout Basement	499.27							Flood Elevation not covered in AMEC Study
1741 Melody Lane	Split Foyer	Walkout Basement	498.96							Flood Elevation not covered in AMEC Study



1815 Melody Lane (Walkout Basement, Watermark)

November 21, 2016

Mr. Ed Blattner, P.E.
Public Works Director
City of Arnold
2900 Arnold Tenbrook Road
Arnold, Missouri 63010

RE: Old Lemay Ferry Road Study
Arnold, Missouri
CBB Job No. 93-16

Dear Mr. Blattner:

As requested, CBB has prepared an engineering review pertaining to the segment of Old Lemay Ferry Road from Pomme Road to Doe Run Drive in Arnold, Missouri. Specifically, the four-lane segment of Old Lemay Ferry Road was reviewed with respect to safety and appropriateness of the existing cross-section in the context of the two-lane road segments on either side. A map of the study location is shown in **Figure 1**.

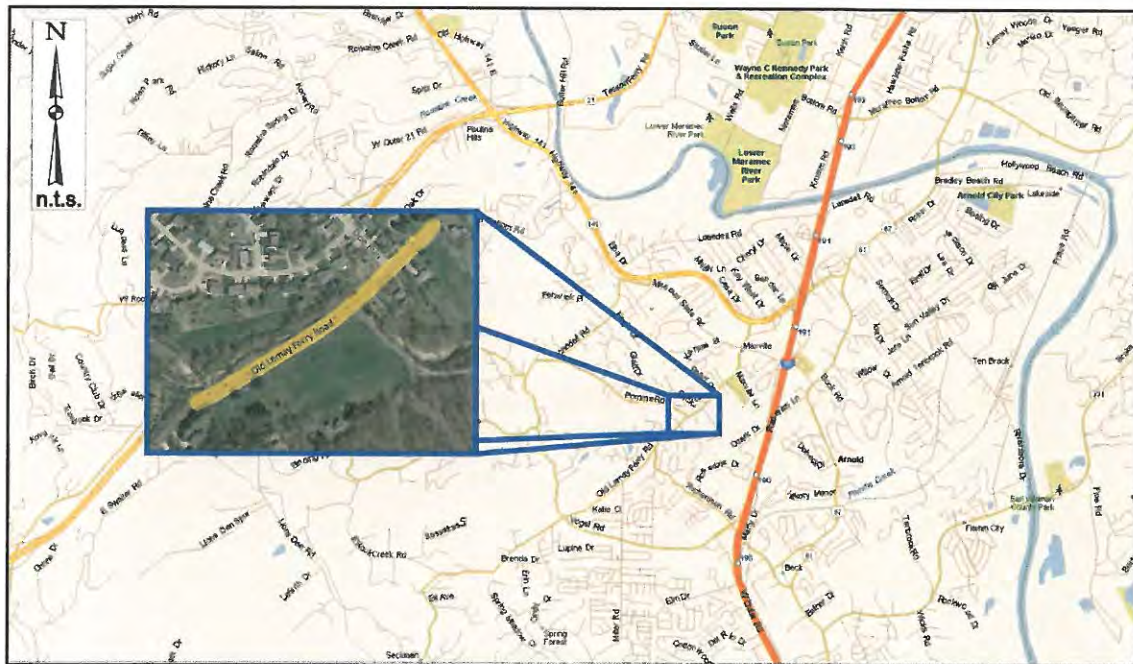


Figure 1: Location Map – Old Lemay Ferry Road: Pomme Road to Doe Run Drive



It is our understanding that the City of Arnold is concerned that the current four-lane cross section of Old Lemay Ferry Road may not be the safest and most appropriate cross-section for this relatively short roadway segment. The purpose of this study was to evaluate the existing cross section with respect to compliance with applicable standards, perform observations during the peak hours to identify the use of the roadway, review the posted speed limit for appropriateness, and review the crash data for the roadway segment.

EXISTING CONDITIONS

Roadway System: Old Lemay Ferry Road is a major collector road that runs north-south, parallel to I-55, through the City of Arnold. Old Lemay Ferry Road is a two-lane roadway in its entirety with the exception of a short four-lane segment between Pomme Road and Doe Run Drive. The four-lane section is approximately 48 feet wide with curb and gutter. The posted speed limit is 30 miles per hour (mph). Sidewalks are provided along the east side of Old Lemay Ferry Road at the back of curb. **Figure 2** shows the four-lane cross section of Old Lemay Ferry Road.



Figure 2: Old Lemay Ferry Road at Fawn Drive Looking North

Existing Traffic Volumes and Speed Data: Machine count data was collected on Old Lemay Ferry Road near Fawn Drive. The data collected included volume of vehicles and vehicle speed. The machine count data was collected from Tuesday afternoon, September 27, to Thursday afternoon, September 29, 2016.



The average daily traffic (ADT) for the studied portion of Old Lemay Ferry Road was approximately 14,200 vehicles per day (vpd). Based on the traffic data collected, the AM peak hour occurred between 7:15 and 8:15 a.m. with a two-way traffic volume of 825 vehicles per hour (vph), while the PM peak hour occurred between 4:30 and 5:30 p.m. with a two-way traffic volume of 1,410 vph. Due to the proximity of I-55 access to the north of the study area, traffic flows along Old Lemay Ferry Road are predominately northbound in the morning and southbound in the afternoon.

It is important to note that at the time of the traffic data collection, Vogel Road was closed just north of Old Lemay Ferry Road to replace a culvert crossing. Pomme Road was designated as a detour route to gain access to the residences off Vogel Road and Tomahawk Road. As a result, the traffic volumes collected in September 2016 for this evaluation are likely higher than the normal traffic levels when Vogel Road is open. For reference, CBB collected traffic counts on Old Lemay Ferry Road approximately ¼ mile south of Pomme Road in May of 2014. Based on the May 2014 traffic count, the ADT on Old Lemay Ferry Road was 10,700 vpd, approximately 25 percent less than the counts collected with the detour two years later.

The machine counts were supplemented with manual turning movement traffic counts conducted by CBB the first week of October 2016 during the weekday AM and PM peak hours at intersections of Old Lemay Ferry Road with Doe Run Drive and with Fawn Drive. The existing weekday AM and PM peak hour traffic volumes are summarized in **Figure 3**.

Based on the machine count data collected, the 85th percentile speed on Old Lemay Ferry Road within the study segment is 35 mph. The 95th percentile speed is 38 mph, meaning only 5 percent of the vehicles are traveling above 38 mph. There were only four vehicles documented during the 48-hour data collection period that exceeded 50 mph.

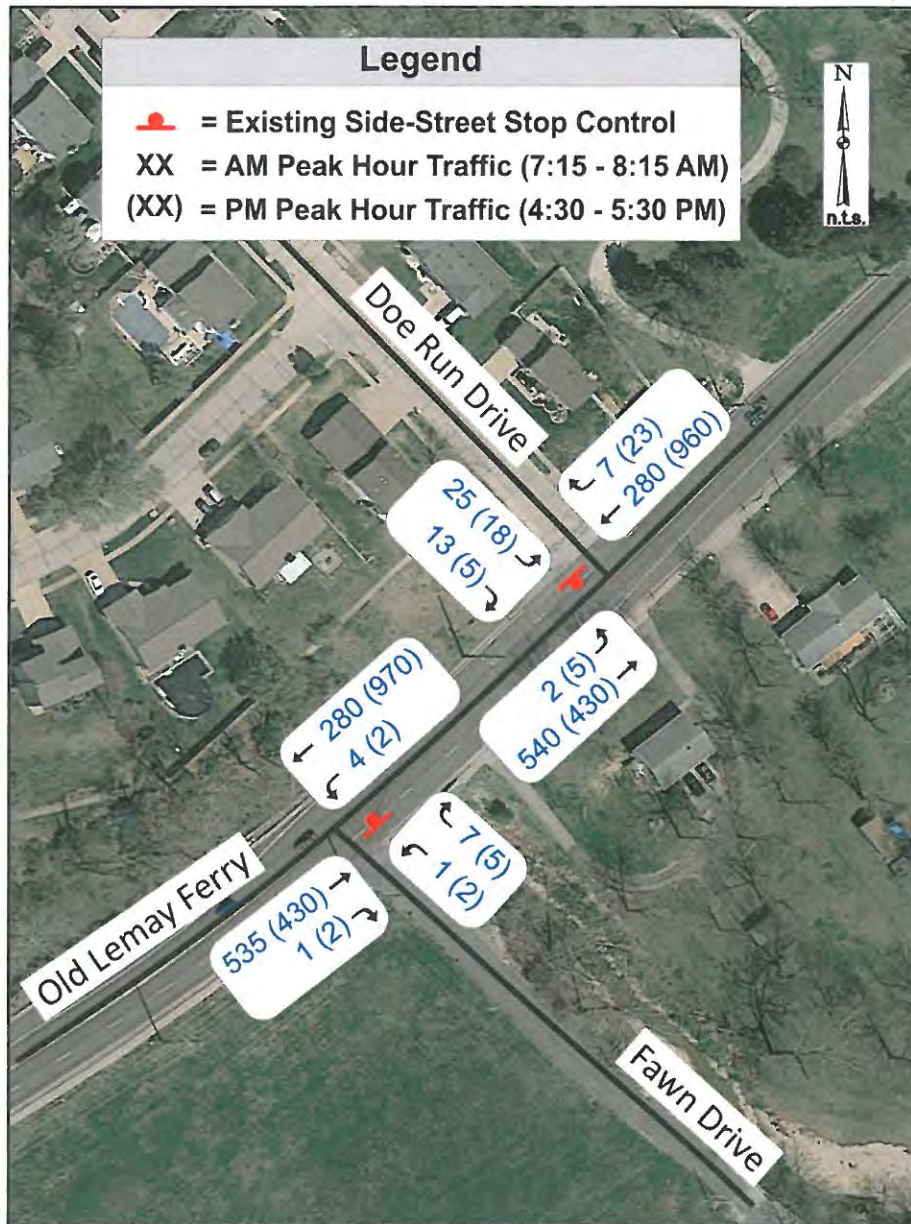


Figure 3: Existing Traffic Volumes

Existing Observations: The volumes along Old Lemay Ferry Road were moderate to heavy during the peak hours, while the turning movements to and from Doe Run Drive and Fawn Drive were light. During the PM peak hour, motorists trying to make a left onto Old Lemay Ferry Road from Doe Run Drive experienced longer delays due to the heavy conflicting traffic volumes on Old Lemay Ferry Road. No lengthy delays or queues were observed on Old Lemay Ferry Road, though there was a fairly steady stream of traffic southbound on Old Lemay Ferry Road during the PM peak hour.



Based on the observations during the peak hours, the passing lane was not utilized to pass vehicles. During both the AM and PM peak hours, no vehicles used the northbound passing lane, while only one vehicle used the southbound passing lane during the PM peak hour. During the AM peak hour, the school bus on southbound Old Lemay Ferry Road that stops at Doe Run Drive used the outside lane to pick up children. When the bus turned off the STOP signal, some of the vehicles waiting in the inside lane passed the bus creating a situation where the bus had to merge left back into the main stream of traffic. A photo of the active school bus stop is shown in **Figure 4**.



Figure 4: School Bus Stop on Southbound Old Lemay Ferry Road at Doe Run Drive

Existing Crash Data: Based on crash data provided by the Arnold Police Department from January 1, 2013 to September 28, 2016 (nearly four years), there have been 14 crashes on Old Lemay Ferry Road between Pomme Road and Pearl Drive. A majority of the crashes, 11 of the 14, occurred at the intersections of Old Lemay Ferry Road with Pomme Road and with Pearl Drive. The primary type of crash was rear-end crashes with a total of seven. There were five angle crashes and two fixed object/deer crashes. Of the 14 crashes, they were primarily property damage only with four injury crashes and no fatality crashes. Based on the crash data, there is not a pattern of crashes related to the merging of vehicles from the four-lane cross-section to the two-lane cross-section of the roadway.



COMMON PRACTICES REGARDING POSTED SPEED LIMITS

Setting Speed Limits: To our knowledge, there are no published “warrants” or specific criteria for the establishment of speed limits. The establishment and enforceability of speed limits lies within the law. City staff should consult with the City attorney to address how the laws of the state of Missouri and the ordinances of the City address or mandate setting speed limits. The difference in legal enforcement of numerical maximum speed limits for “absolute” speed limits versus “prima facie” speed influence the way those limits must be set. “Absolute” limits set a maximum number which cannot be exceeded, while “prima facie” limits are enforced through the legal system much differently based on findings as to whether the operator is driving in a reasonably safe manner based on prevailing conditions.

The *Uniform Vehicle Code* (UVC), which is adopted by the state of Missouri in some parts or form, generally indicates that when an agency having jurisdiction over a road “determine[s] upon the basis of an engineering and traffic investigation that any maximum speed herein before set forth is greater or less than is reasonable or safe under the conditions found to exist at any intersection or other place or upon any part of the highway system, said (agency) may determine and declare a reasonable and safe maximum limit” This is the closest to a “requirement” of how speed limits must be set of which we are aware.

It is generally accepted practice that the engineering and traffic investigation mandated by the UVC consists of a speed limit study which addresses: prevailing vehicle speeds, physical features of the roadway, crash experience and traffic characteristics/control.

The preferred method of establishing speed limits on existing streets is the 85th percentile speed. Data is collected for the existing traffic stream, and speeds are set in 5 mph increments for the speed at or below which 85 percent of the vehicle population is voluntarily traveling. Multiple studies have proven that if drivers do not consider the speed limits reasonable, they will disobey. The speed data should be accompanied by an evaluation of the other elements of the speed limit study.

Old Lemay Ferry Road Speed Limit: As mentioned previously, the 85th percentile speed on Old Lemay Ferry Road within the study segment is 35 mph, which is 5 mph over the posted speed limit of 30 mph. Furthermore, the crash data provided does not indicate a prevailing crash history related to speeding and does not reflect a high rate of injuries with no fatalities. Common practice suggests that the posted speed limit on Old Lemay Ferry Road *could* be raised to 35 mph, the 85th percentile speed. Therefore, it is recommended that either the existing posted speed limit of 30 mph on Old Lemay Ferry Road be maintained or raised to 35 mph.



ADEQUACY OF TWO-LANE CROSS-SECTION

The maximum Annual Average Daily (AAD) traffic volume was based upon information provided in the latest edition of the *Quality Level of Service Handbook*, published by the State of Florida Department of Transportation. The *Quality Level of Service Handbook* (QLOS) determines the capacity of a roadway based upon different variables such as the posted speed, urban versus rural roadway, and state versus local roadway. LOS is a measure of traffic flow which considers such factors as speed, delay, traffic interruptions, safety, driver comfort, and convenience. Level C, which is normally used for highway design, represents a roadway with volumes ranging from 70% to 80% of its capacity. However, Level D is generally considered acceptable for peak period conditions.

Old Lemay Ferry Road is a two-lane undivided suburban arterial roadway with a posted speed of 35 mph. The QLOS handbook determines that such a roadway has an AAD maximum capacity of 15,600 vehicles for state routes and 14,040 vehicles for non-state routes. In order to achieve LOS D, the AAD maximum is 14,800 vehicles for state routes and 13,320 vehicles for non-state routes. Thus, the existing daily traffic volume on Old Lemay Ferry Road of 14,200 vpd is right at the theoretical capacity of the two-lane roadway. However, as mentioned previously, the traffic volumes collected on Old Lemay Ferry Road were higher due to the Vogel Road closure. The ADT in 2014 was 10,700 which would be well under the capacity of the roadway. Thus, a two-lane cross-section for Old Lemay Ferry Road is reasonable, though it is recommended that separate left-turn lanes be provided at the higher volume side-streets to maintain the flow of traffic where possible. However, it is important to note that as the traffic volumes on Old Lemay Ferry approach 14,000 vpd, it may be necessary to consider a 3-lane cross-section.



ROADWAY COMPLIANCE WITH AASHTO STANDARDS

The existing roadway geometrics, specifically the length of the four-lane cross-section and the taper distances for the lane drops were compared to the guidelines found in A Policy on Geometric Design of Highways and Streets published by the American Association of State Highway and Transportation Officials (AASHTO), commonly referred to as the Green Book. **Exhibit 1** illustrates the existing passing lane and taper lengths on Old Lemay Ferry Road.

AASHTO recommends a minimum of 1,000 feet for a passing lane. As shown in **Exhibit 1**, the southbound passing lane is 265 feet and the northbound passing lane is 560 feet which is far below the recommended minimum of 1,000 feet. Furthermore, the recommended transition taper for the lane drop is 420 feet ($L = WS$; $W=12$ feet and $S=35$ mph design speed). As shown in **Exhibit 1**, the southbound lane drop taper is 120 feet and the northbound lane drop taper is 180 feet which are both also far below the recommended minimum of 420 feet.

The fact that hardly anyone is using the passing lanes is likely attributable to the deficient lengths. Motorists are not comfortable in their ability to pass a vehicle and merge back into traffic within the lengths provided. If motorists were to use the existing passing lanes, it would likely lead to aggressive driving with having to accelerate quickly to pass someone and then merge back into a single lane in a very short distance. As such, it is recommended that the existing four-lane cross-section be eliminated. The existing four-lane section could be restriped as a two-lane section to match the current cross-section of Old Lemay Ferry Road both north and south of this segment as depicted in **Exhibit 2**. Alternatively, a three-lane cross-section could be striped to provide a center left-turn lane which would provide the ability for motorists to get out of the main traffic flow to wait and make their left-turn maneuver as depicted in **Exhibit 3**. However, as shown in **Figure 4**, the left-turn volumes at Fawn Drive and Doe Run Drive are very low and do not justify the need for a separate left-turn lane.

As mentioned previously, sidewalks are provided along the east side of Old Lemay Ferry Road at the back of curb. Given the character of the roadway and lower travel speeds, it is reasonable to provide sidewalk at the back of curb. However, by restriping the existing four-lane section to a two- or three-lane section, a painted buffer could be provided to further physically separate the travel lanes and the existing sidewalk which would be an added benefit.

Although both a two- or three-lane cross-section is appropriate for the existing four-lane segment, the three-lane cross section would be preferred since it would provide a center left-turn lane which would provide the ability for motorists to get out of the main traffic flow to wait and make their left-turn maneuver. Furthermore, if striped as a two-lane segment with wide shoulders, there may be the potential for motorists to still try and pass slower moving traffic on the shoulders which would not be wanted.



Exhibit 1: Existing Geometrics on Old Lemay Ferry Road



Exhibit 1: Two Lane Cross Section



Exhibit 1: Three Lane Cross Section



SUMMARY

The following is a summary of the findings and recommendations pertaining to the four-lane segment of Old Lemay Ferry Road from Pomme Road to Doe Run Drive in Arnold, Missouri.

- The 85th percentile speed on Old Lemay Ferry Road within the study segment is 35 mph, which is 5 mph over the posted speed limit of 30 mph. Furthermore, the crash data provided does not indicate a prevailing crash history related to speeding. Common practice suggests that the posted speed limit on Old Lemay Ferry Road *could* be raised to 35 mph, the 85th percentile speed. Therefore, it is recommended that either the existing posted speed limit of 30 mph on Old Lemay Ferry Road be maintained or raised to 35 mph.
- The existing daily traffic volume on Old Lemay Ferry Road of 14,200 vpd is right at the theoretical capacity of the two-lane roadway. However, the traffic volumes recently collected on Old Lemay Ferry Road were most likely higher due to the Vogel Road closure. The ADT in 2014 was 10,700 which would be well under the capacity of a two-lane roadway. Thus, a two-lane cross-section for Old Lemay Ferry Road is reasonable, though it is recommended that separate left-turn lanes be provided at the higher volume side-streets to maintain the flow of traffic where possible. However, it is important to note that as the traffic volumes on Old Lemay Ferry approach 14,000 vpd, it may be necessary to consider a 3-lane cross-section.
- Based on a review of the existing passing lane and taper lengths on Old Lemay Ferry Road and their compliance with the AASHTO Green Book standards, the existing passing lane length and taper lengths are much less than the recommended minimums. The fact that hardly anyone is using the passing lanes is likely attributable to the deficient lengths. Motorists are not comfortable in their ability to pass a vehicle and merge back into traffic within the distance provided. If motorists were to use the existing passing lanes, it would likely lead to aggressive driving with having to accelerate quickly to pass someone and then merge back into a single lane in a short distance. As such, it is recommended that the existing four-lane cross-section along Old Lemay Ferry Road be eliminated and restriped with a three-lane cross section.

We trust that this review of Old Lemay Ferry Road from Pomme Road to Doe Run Drive in Arnold, Missouri is useful as you consider possible modifications to this section of Old Lemay Ferry Road. Should there be any questions regarding this review, please contact me at 314-449-9572 or swhite@cbbtraffic.com.

Sincerely,

Shawn Lerai White, P.E., PTOE

Associate - Senior Traffic Engineer