MEMORANDUM

TO: CITY COUNCIL

FROM: TERESA MCCLISH, DIRECTOR OF COMMUNITY DEVELOPMENT

BY: MATT HORN, CITY ENGINEER

SUBJECT: CONSIDERATION OF TRAFFIC WAY BRIDGE REPLACEMENT PROJECT PROGRAMMING

DATE: SEPTEMBER 22, 2015

RECOMMENDATION:
It is recommended the City Council authorize staff to program the Traffic Way Bridge Replacement Project into the Highway Bridge Program for future grant funding.

IMPACT ON FINANCIAL AND PERSONNEL RESOURCES:
The Highway Bridge Program will fund 88.53% of the costs for the Traffic Way Bridge replacement. Anticipated project costs are shown below:

Traffic Way Bridge Replacement Costs					
Project Phase	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Total**
Preliminary Engineering	$400,000				$400,000
Right-of-Way		$100,000			$100,000
Construction				$4,000,000	$4,000,000
					$4,500,000
Local Fund Match					
Project Phase	**2016/17**	**2017/18**	**2018/19**	**2019/20**	**Total**
Preliminary Engineering	$45,880				$45,880
Right-of-Way		$11,470			$11,470
Construction				$458,800	$458,800
					$516,150

Once grant funds are authorized and prior to local fund match obligation, staff will return to City Council with a funding plan for the local match portion of the project. This work is not directly related to the Critical Needs Action Plan, but allows for the City to leverage outside funding to replace infrastructure.

BACKGROUND:
The Traffic Way Bridge spans Arroyo Grande Creek allowing Traffic Way to connect to West Branch Street. Traffic Way is an arterial roadway that conveys approximately 11,000 vehicles per day.

Vicinity Map

The Traffic Way Bridge was constructed in 1932 making the bridge 83 years old. In general, the design life of a bridge is 100 years. The Traffic Way Bridge is a reinforced concrete structure which is supported by abutments on each end of the bridge as well as concrete piles.

Photos of Traffic Way Bridge

Caltrans completes bridge inspections for the Traffic Way Bridge once every two years. In 2006, the bridge was designated scour critical meaning that the supporting members of the bridge are compromised due to erosions of surrounding soil. The last inspection of the Traffic Way Bridge was completed on October 24, 2014. This inspection found signs of deck cracking, failed expansion joints, spalling concrete, concrete abrasion, and creek channel erosion.

Bridge inspection reports provide information on bridge maintenance needs and an overall condition rating of the bridge, known as the sufficiency rating. Sufficiency rates range from 0 to 100. A sufficiency rating of 100 is the best rating a bridge may receive and 0 is the worst. In addition to sufficiency ratings, if a bridge scores low in the following inspection categories, it is given a special status of Structurally Deficient.

1. Bridge deck condition
2. Bridge superstructures or substructures
3. Bridge retaining walls
4. Bridge overall structural condition
5. Bridge waterway adequacy

If the bridge scores low in the following inspection categories it is given a special status of Functional Obsolete.

1. Bridge deck geometry
2. Bridge under-clearance
3. Roadway approach angles into the bridge
4. Bridge overall structural condition
5. Bridge waterway adequacy

While there is some overlap between the special status indicators of overall structural condition and waterway adequacy, in general the Structurally Deficient indicator means corrective action needs to be taken to remedy the bridge's ability to carry loads. Functionally Obsolete means, while the bridge may have served its purpose when constructed, it needs to be modified to increase the usability of the bridge.

The Traffic Way Bridge has a current Sufficiency Rating of 50.9 with a special status indicator of Functionally Obsolete. The last bridge inspection ratings make this structure eligible for Highway Bridge Program replacement funds.

ANALYSIS OF ISSUES:

The largest factor making the Traffic Way Bridge eligible for rehabilitation and replacement funds through the Highway Bridge Program is channel scour. Channel scour is the process of flowing water eroding the creek bed away from the bridge. If this erosion occurs adjacent to a bridge's supports, the bridge is then classified as scour critical. It is estimated that the Arroyo Grande creek's channel has been lowered by approximately 12 feet in the last 83 years, which has in-turn reduced the supporting piles' ability to hold up the Traffic Way Bridge.

Staff and Caltrans have conferred on solutions to deal with the scour issue and agree that moving forward with bridge replacement work is the most cost effective solution in this situation. At present time, we have the opportunity to replace the bridge and install a new bridge that will not be as susceptible to creek erosion or scour that will last 100 years or more.

Moving forward with scour countermeasure design, permitting and installation will likely be costly, require a large effort to permit through waterway regulatory agencies and could increase the flood surface elevation, making adjacent properties more susceptible to flood waters. Flood surface elevations would increase because the creek channel would need to be filled about 12 feet, or the amount the creek bed has scoured.

ALTERNATIVES:
The following alternatives are provided for the Council's consideration:

- Approve staff recommendation;
- Do not approve staff recommendation; or
- Provide direction to staff.

ADVANTAGES:
Programming the Traffic Way Bridge into the Highway Bridge Program for future replacement will allow for a bridge structure that is near the end of its design life to be replaced with a more suitable structure that is not prone to creek channel scour.

DISADVANTAGES:
Staff time and future funding will be required. Not using Highway Bridge Program funding will significantly impact the City's financial cirmcumstances.

ENVIRONMENTAL REVIEW:
The action of programming grant funding does not require environmental review. The Preliminary Engineering work includes environmental studies. This project will be subject to both the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance. Once complete this environmental determination will be presented to City Council.

PUBLIC NOTIFICATION AND COMMENTS:
The Agenda was posted in front of City Hall on Thursday, September 17, 2015. The Agenda and staff report were posted on the City's website on Friday, September 18, 2015.

ATTACHMENT:

1. Bridge Inspection Report

DEPARTMENT OF TRANSPORTATION
Structure Maintenance & Investigations

Bridge Number : 49C0318
Facility Carried: TRAFFIC WAY
Location : ARROYO GRANDE
City : ARROYO GRANDE
Inspection Date : 10/24/2014

Bridge Inspection Report

Inspection Type

Routine	FC	Underwater	Special	Other
X				

STRUCTURE NAME: ARROYO GRANDE CREEK

CONSTRUCTION INFORMATION

Year Built : 1932
Year Widened: N/A
Length (m) : 69.5

Skew (degrees): 37
No. of Joints : 6
No. of Hinges : 0

Structure Description: Simple span RC "T" girders (8) on RC pile (8) bents with RC wall abutments on concrete piles. RC wingwalls at Northerly end.

Span Configuration : 6@11.3m

SAFE LOAD CAPACITY AND RATINGS

Design Live Load: M-13.5 OR H-15
Inventory Rating: RF=0.47 =>15.2 metric tons — Calculation Method: FIELD EVAL/ENG JUDGMENT
Operating Rating: RF=0.78 =>25.3 metric tons — Calculation Method: FIELD EVAL/ENG JUDGMENT
Permit Rating : XXXXX
Posting Load : Type 3: Legal Type 3S2: Legal Type 3-3: Legal

DESCRIPTION ON STRUCTURE

Deck X-Section: 0.6m rail, 1.25 sw, 12.2m , 1.25m sw, 0.6m rail
Total Width: 15.8 m Net Width: 12.2 m No. of Lanes: 3 Speed: 30 mph
Min. Vertical Clearance: Unimpaired
Rail Code: 0000 Rail Description: Concrete with CLF

DESCRIPTION UNDER STRUCTURE

Channel Description: sand and gravel

NOTICE

The bridge inspection condition assessment used for this inspection is based on the American Association of State Highway and Transportation Officials (AASHTO) Bridge Element Inspection Manual 2013 as defined in Moving Ahead for Progress in the 21st Century (MAP-21) federal law. The new element inspection methodology may result in changes to related condition and appraisal ratings on the bridge without significant physical changes at the bridge.

The element condition information contained in this report represents the current condition of the bridge based on the most recent routine and special inspections. Some of the notes presented below may be from an inspection that occurred prior to the date noted in this report. Refer to the Scope and Access section of this inspection report for a description of which portions of the bridge were inspected on this date.

INSPECTION COMMENTARY

SCOPE AND ACCESS

There were no access limitations encountered during this routine inspection. A full bridge inspection was performed. An updated channel cross section was performed.

SAFE LOAD CAPACITY

The load rating for this structure is being reviewed by the SMI Ratings Branch. The current rating has been assigned in accordance with SMI procedures.

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4
16			Top Flange-RC	2	1098	sq.m	248	850	0	0
	1130		Cracking (RC and Other)	2	850		0	850	0	0
(16-1130) The deck exhibits hairline pattern cracking (<0.5 millimeters wide) and areas with moderately sized (< 0.75 millimeters wide) transverse and longitudinal cracks varying from short to approximately 1 meter in length. Aggregate pop-outs throughout the deck persist. The deck distress has remained relatively stable since the previous inspection.										
110			Girder/Beam-RC	2	556	m	552	4	0	0
	1090		Exposed Rebar (PS Conc./RC)	2	4		0	4	0	0
(110-1090) Girder 5, Span 2 exhibits several exposed and rusting reinforcing bars. The distress has remained stable for the past several inspections.										
205			Column-RC	2	40	each	32	8	0	0
	1190		Abrasion (PS Conc./RC)	2	8		0	8	0	0
(205-1190) The pile group in Bent 5 exhibits heavy abrasion along the water line.										
215			Abutment-RC	2	40	m	40	0	0	0
(215) There were no significant defects noted.										
227			Pile-RC	2	6	ea.	0	6	0	0
	6000		Scour	2	6		0	6	0	0
(227-6000) Runoff has caused erosion holes at both abutments near the centerline. The piles are exposed approximately 0.25 meters at Abutment 1. This condition has remained relatively stable since the previous inspection.										
234			Pier Cap-RC	2	88	m	88	0	0	0
(234) There were no significant defects noted.										
300			Joint-Strip Seal Exp	2	75	m	69	6	0	0
	2360		Adjacent Deck or Header (Joints)	2	6		0	6	0	0
(300-2360) There is a spall in the right wheel line southbound adjacent to the joint measuring approximately 0.2 meters x 0.2 meters. No reinforcement is exposed (see work recommendations).										
304			Joint-Open Expansion	2	69	m	69	0	0	0
(304) There were no significant defects noted.										
311			Bearing-Moveable	2	48	each	48	0	0	0
(311) There were no significant defects noted.										
313			Bearing-Fixed	2	48	each	48	0	0	0

ELEMENT INSPECTION RATINGS AND COMMENTARY

Elem No.	Defect /Prot	Defect	Element Description	Env	Total Qty	Units	Qty in each Condition State St. 1	St. 2	St. 3	St. 4
(313)										
There were no significant defects noted.										
331			**Railing-RC**	2	139	m	139	0	0	0
(331)										
There were no significant defects noted.										

WORK RECOMMENDATIONS

RecDate: 10/18/2012 Action : Deck-Patch spalls Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Patch deck spall adjacent to the joint in the right wheel line southbound.
RecDate: 12/10/2008 Action : Deck-Methacrylate Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 1 YEAR DistTarget: EA:		Treat the deck with methacrylate.
RecDate: 12/10/2008 Action : Joints-Repair/Clean Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 1 YEAR DistTarget: EA:		Repair the damaged joint header at Bents 3 and 6.
RecDate: 01/13/2006 Action : Undefined Work Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: DistTarget: EA:		The Local Agency should investigate and provide adequate scour countermeasures for this structure. We recommend monitoring the structure during the flood events until the designed scour counter measure has properly been constructed and remove drift and debris as required.
RecDate: 10/07/2002 Action : Undefined Work Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Remove the drift debris accumulating on the upstream side of Bents 4 and 5.
RecDate: 11/01/1993 Action : Undefined Work Work By: LOCAL AGENCY Status : PROPOSED	EstCost: StrTarget: 2 YEARS DistTarget: EA:		Back fill erosion and construct drainage system at both abutments.

CHANNEL X-SECTION

Side : Upstream
Measured From : Top of RC curb
X-Section Date: 10/24/2014

Location	Horiz(m)	Vert(m)	Comments
Abutment 1		0.74	
Bent 2		5.21	
Bent 3		8.56	
Bent 4		10.62	
Bent 5		8.73	

CHANNEL X-SECTION

Side : Upstream
Measured From : Top of RC curb

X-Section Date: 10/24/2014

Location	Horiz(m)	Vert(m)	Comments
Bent 6		7.66	
Abutment 7		5.65	

Team Leader : Anthony Fernandes

Report Author : Anthony Fernandes

Inspected By : A.Fernandes/EJ.Halsted

1/15/15

Anthony Fernandes (Registered Civil Engineer) (Date)

STRUCTURE INVENTORY AND APPRAISAL REPORT

********** IDENTIFICATION **********

(1) STATE NAME- CALIFORNIA 069
(8) STRUCTURE NUMBER **49C0318**
(5) INVENTORY ROUTE(ON/UNDER)- ON 150000000
(2) HIGHWAY AGENCY DISTRICT 05
(3) COUNTY CODE 079 (4) PLACE CODE 02868
(6) FEATURE INTERSECTED- ARROYO GRANDE CREEK
(7) FACILITY CARRIED- TRAFFIC WAY
(9) LOCATION- ARROYO GRANDE
(11) MILEPOINT/KILOMETERPOINT 0
(12) BASE HIGHWAY NETWORK- NOT ON NET 0
(13) LRS INVENTORY ROUTE & SUBROUTE
(16) LATITUDE 35 DEG 07 MIN 19.87 SEC
(17) LONGITUDE 120 DEG 34 MIN 49.88 SEC
(98) BORDER BRIDGE STATE CODE % SHARE %
(99) BORDER BRIDGE STRUCTURE NUMBER

******** STRUCTURE TYPE AND MATERIAL *********

(43) STRUCTURE TYPE MAIN:MATERIAL- CONCRETE
TYPE- TEE BEAM CODE 104
(44) STRUCTURE TYPE APPR:MATERIAL- OTHER/NA
TYPE- OTHER/NA CODE 000
(45) NUMBER OF SPANS IN MAIN UNIT 6
(46) NUMBER OF APPROACH SPANS 0
(107) DECK STRUCTURE TYPE- CIP CONCRETE CODE 1
(108) WEARING SURFACE / PROTECTIVE SYSTEM:
A) TYPE OF WEARING SURFACE- NONE CODE 0
B) TYPE OF MEMBRANE- NONE CODE 0
C) TYPE OF DECK PROTECTION- NONE CODE 0

********** AGE AND SERVICE **********

(27) YEAR BUILT 1932
(106) YEAR RECONSTRUCTED 0000
(42) TYPE OF SERVICE: ON- HIGHWAY-PEDESTRIAN 5
UNDER- WATERWAY 5
(28) LANES:ON STRUCTURE 03 UNDER STRUCTURE 00
(29) AVERAGE DAILY TRAFFIC 9600
(30) YEAR OF ADT 2010 (109) TRUCK ADT 4 %
(19) BYPASS, DETOUR LENGTH 2 KM

********** GEOMETRIC DATA **********

(48) LENGTH OF MAXIMUM SPAN 11.3 M
(49) STRUCTURE LENGTH 69.5 M
(50) CURB OR SIDEWALK: LEFT 1.8 M RIGHT 1.8 M
(51) BRIDGE ROADWAY WIDTH CURB TO CURB 12.2 M
(52) DECK WIDTH OUT TO OUT 15.8 M
(32) APPROACH ROADWAY WIDTH (W/SHOULDERS) 12.2 M
(33) BRIDGE MEDIAN- NO MEDIAN 0
(34) SKEW 37 DEG (35) STRUCTURE FLARED NO
(10) INVENTORY ROUTE MIN VERT CLEAR 99.99 M
(47) INVENTORY ROUTE TOTAL HORIZ CLEAR 12.2 M
(53) MIN VERT CLEAR OVER BRIDGE RDWY 99.99 M
(54) MIN VERT UNDERCLEAR REF- NOT H/RR 0.00 M
(55) MIN LAT UNDERCLEAR RT REF- NOT H/RR 0.0 M
(56) MIN LAT UNDERCLEAR LT 0.0 M

********** NAVIGATION DATA **********

(38) NAVIGATION CONTROL- NO CONTROL CODE 0
(111) PIER PROTECTION- CODE
(39) NAVIGATION VERTICAL CLEARANCE 0.0 M
(116) VERT-LIFT BRIDGE NAV MIN VERT CLEAR M
(40) NAVIGATION HORIZONTAL CLEARANCE 0.0 M

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SUFFICIENCY RATING = 50.9
STATUS FUNCTIONALLY OBSOLETE
HEALTH INDEX 88.4
PAINT CONDITION INDEX = N/A

********** CLASSIFICATION ********** CODE

(112) NBIS BRIDGE LENGTH- YES Y
(104) HIGHWAY SYSTEM- NOT ON NHS 0
(26) FUNCTIONAL CLASS- COLLECTOR URBAN 17
(100) DEFENSE HIGHWAY- NOT STRAHNET 0
(101) PARALLEL STRUCTURE- NONE EXISTS N
(102) DIRECTION OF TRAFFIC- 2 WAY 2
(103) TEMPORARY STRUCTURE-
(105) FED.LANDS HWY- NOT APPLICABLE 0
(110) DESIGNATED NATIONAL NETWORK - NOT ON NET 0
(20) TOLL- ON FREE ROAD 3
(21) MAINTAIN- CITY OR MUNICIPAL HIGHWAY AGENCY 04
(22) OWNER- CITY OR MUNICIPAL HIGHWAY AGENCY 04
(37) HISTORICAL SIGNIFICANCE- NOT ELIGIBLE 5

********** CONDITION ********** CODE

(58) DECK 6
(59) SUPERSTRUCTURE 8
(60) SUBSTRUCTURE 7
(61) CHANNEL & CHANNEL PROTECTION 7
(62) CULVERTS N

********* LOAD RATING AND POSTING ********* CODE

(31) DESIGN LOAD- M-13.5 OR H-15 2
(63) OPERATING RATING METHOD- FIELD EVAL/ENG JUD 0
(64) OPERATING RATING- 25.3
(65) INVENTORY RATING METHOD- FIELD EVAL/ENG JUD 0
(66) INVENTORY RATING- 15.2
(70) BRIDGE POSTING- EQUAL TO OR ABOVE LEGAL LOADS 5
(41) STRUCTURE OPEN, POSTED OR CLOSED- A
DESCRIPTION- OPEN, NO RESTRICTION

********** APPRAISAL ********** CODE

(67) STRUCTURAL EVALUATION 3
(68) DECK GEOMETRY 4
(69) UNDERCLEARANCES, VERTICAL & HORIZONTAL N
(71) WATER ADEQUACY 9
(72) APPROACH ROADWAY ALIGNMENT 6
(36) TRAFFIC SAFETY FEATURES 0000
(113) SCOUR CRITICAL BRIDGES 3

********** PROPOSED IMPROVEMENTS **********

(75) TYPE OF WORK- MISC STRUCTURAL WORK CODE 38
(76) LENGTH OF STRUCTURE IMPROVEMENT 69.5 M
(94) BRIDGE IMPROVEMENT COST $1,101,000
(95) ROADWAY IMPROVEMENT COST $220,200
(96) TOTAL PROJECT COST $1,849,680
(97) YEAR OF IMPROVEMENT COST ESTIMATE 2010
(114) FUTURE ADT 10304
(115) YEAR OF FUTURE ADT 2034

********** INSPECTIONS **********

(90) INSPECTION DATE 10/14 (91) FREQUENCY 24 MO
(92) CRITICAL FEATURE INSPECTION: (93) CFI DATE
A) FRACTURE CRIT DETAIL- NO MO A)
B) UNDERWATER INSP- NO MO B)
C) OTHER SPECIAL INSP- NO MO C)

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