AASHTOWare Bridge Management Update





AASHTOWare Bridge Management

User Group Priorities

User Group Concern/Priority Description	Alert Status	Priority Level	Response
Online help for version 5	High	1a	Refreshed manuals are being developed and are slated for release alongside BrM 5. Updated versions in 5.2.2.
Better documentation (User guide and Installation guide)	High	1b	Refreshed manuals are being developed and are slated for release alongside BrM 5. Updated versions in 5.2.2.
Implement Alabama customization as an option	High	2	Planned for the BrM 5.2.3 release.
Better QC/QA on contractor	High	3	Updated QA and code review practices. Ongoing process to always improve.
Better error handling	High	4	Ongoing, 5.2.3 will be a significant step forward with this.
We want to keep inspkey on Inspection screen	High	5	INSPKEY will remain on the screens in 5.2.
AASHTO to host TAG and TRT members at the User Group Meetings	Med	6	Complete. Inclusion of additional TAG and TRT members will be reviewed on a case case basis.
64-bit rewrite	Med	6b	Complete. Workstation remains 32bit.
AASHTO BRIDGEWare website needs to be kept up to date	Med	7	Complete. On-going process
Need to include SHV Load Ratings now	Med	8	Complete as of 5.2.2
Better Oracle support	Med	9a	Ongoing. Bentley continues to focus on testing Oracle more aggressively. Oracle TA members report significantly better stability in 5.2.2
More stress testing	Med	9b	Ongoing. Bentley has implemented stress testing software(Visual Studios web performance and load testing framework) in its QA processes. Florida has helped te this with 5.2.2 and have seen significant improvements
Change log – connected to JIRA issues (log of resolved issues)	Med	10a	Complete, separate buckets being used to track all changes
Slow down on modeling and analysis project planning and focus on performance inspection	Med	10b	Ongoing. BrM 5.2.2 was heavily focused on increasing performance through inclusio items such as an updated data layer and the switch to GUIDS.
Can we get Crystal Reports 2013 ASAP	Low	11	Complete.
SharePoint hosted site for TAG	Low	12	Complete.
Auto name files during uploading for media files	Low	13	Deferred for a later release.

AASHTOWare Bridge Management

Bridge Management 5.2 Stages

- Development on 5.2 is rapidly moving forward with coordinated efforts between the Task Force, TRT, and Contractor
- Phased releases
 - Version 5.1.2/5.1.3 (Mar 2012 / May 2013)
 - New inspection and inventory functionality, integration with mapping
 - Version 5.2.1 (Feb 2014)
 - Core program framework, risk assessments, integrated utility functions, network corridors
 - Version 5.2.2 (October 2015)
 - Implementation of new deterioration models and multi-objective analysis
 - Version 5.2.3 (Planned 2016)
 - Enhancements to Deterioration Modeling
 - Integrated project and program planning
 - All administrative features



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Bridge Management 5.2 Stages



AASHTOWare Bridge Management

MAP-21

Upon final delivery of the AASHTOWare Bridge Management 5.x software, the software will fulfill all MAP-21 requirements:

- Collecting, processing, storing, and updating inventory and condition data for all NHS bridge and pavement assets;
 Currently supported for bridges.
- 2. Forecasting deterioration for all NHS bridge and pavement assets; In BrM 5.2.3 we will have full implementation for all NHS bridges.
- 3. Determining the life-cycle benefit-cost analysis of alternative strategies (including a no action decision) for managing the condition of all NHS bridge and pavement assets;

Currently partially supported in BrM 5.2.2 for bridges, and will be fully supported in BrM 5.2.3.



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MAP-21 (Cont'd)

- Identifying short- and long-term budget needs for managing the condition of all NHS bridge and pavement assets;
 Will be fully supported in BrM 5.2.3.
- Determining the optimal strategies for identifying potential projects for managing pavements and bridges; and
 Will be supported in BrM 5.2.3 for bridges.
- Recommending programs and implementation schedules to manage the condition of all Interstate highway pavements, non-Interstate NHS highway pavements, and NHS bridge assets within policy and budget constraints.
 Will be supported in BrM 5.2.3 for bridges.



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Bridge Management 5.2.1

- Released in Spring 2014
- Key Features
- Google Mapping Functions
- Utility Functions
- Needs Prioritization
- Support For 2013 Element Inspection Manual
- Cross-Browser Support
- Key User Requests



AASHTOWare Bridge Management

Bridge Management 5.2.1 SP2

- Released in January 2015
- Key Features
 - FHWA Bridge Element submission and validation checks
 - Upgrade to the latest version of Crystal Reports (2013)
 - Enterprise version of SP2 has been upgraded to be 64 bit compatible
 - Specific TAG identified upgrades, enhancements, and stabilizations to the product



AASHTOWare Bridge Management

Bridge Management 5.2.1 SP3

- Released in April 2015
- Key Features
 - Addresses a page load issue encountered by users with a significant amount of element records tied to a single bridge.
 - Stores and displays ampersands ("&") as ampersands. This was not done previously in all prior versions of the software.



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Bridge Management 5.2.2

- Currently in Beta
- Planned Release in October 2015
- Key Features
 - Deterioration Modeling including Weibull shaping parameters and protection factors for protective elements
 - Project Planning and Analysis Module
 - Conversion of the database from Metric to U.S. Customary units
 - New Inspection Process to better handle inspection dates and data for the NBI submittal
 - Application Programming Interface (API)
 - Database GUID conversion



AASHTOWare Bridge Management

Deterioration Modeling

- An agency is able to see the direct impact of performing work on an asset, and how it will impact the bridge currently, as well as years into the future
- Also able to see the *direct impact of performing work at a later point in time*. This aids an agency in the decision to determine when the <u>optimized time would</u> <u>be to perform</u> the selected work.



AASHTOWare Bridge Management

Deterioration Modeling and Multi Objective Analysis (Example)

	Work Candidates Existing for the Selected Bridge										
\star	Work Candidate			Utility	Utility Change	Cost	Bene	efit / Co	st (\$k)	Cost (\$k) / Benefi	t Action Year
	Do Nothing			49.92							0
	04 0759-NIMO-041614-27F109E126 - Approach Railing-Repair			50.5	0.58	\$2,000.00			.29	\$:	3 0
	K < 1 > > Page size: 10 -										2 items in 1 pages
\star	Effects on Each Utility Criterion				Effects on Each Elemen	t					
	Category name	Before WC	After W	c 🚺	> Element			Str.	Env.	Condition	Effect
	Total Utility	49.92	50.5					Unit			
	Condition	58.32	59.73		> (12) Re Concrete D	eck		0	Low (2)		
	Deck	5	5		(331) Re Conc Brid	ge Railing		0	Low (2)		
	Superstructure	81	81		(510) Wearing	Surfaces		0	۳		
	Substructure	91	91		D 4 3 4						
	Scour	58	58							↓	
	Element ratings	63.35	100			Bridge				Element: 331	
	(12) Reinforced Concrete Deck	70.95	100				Action		100		Action
	(331) Reinforced Concrete Bridge Railing	63.85	100		8 80		Default	(%	80	\sim	Default
	(510) Wearing Surfaces	55.26	100		60 to			- le	60 - 50 -		
	Risk	53.81	53.81		40 40 40			1 E	40		
	Accident	53.81	53.81		9 20 1			Hea	20		
	Mobility	34.2	34.2		10 1				10 1		
	Percent of truck detoured.	34.2	34.2		0 10 20	30 40 50 60 Years	70 80 90 10		0	10 20 30 40 50 60 Years	70 80 90 100
						10010				.cai3	

AASHTOWare Bridge Management

Deterioration Modeling and Multi Objective Analysis (Example)





Project Planning Preservation Actions

- Ability to create and view projects
- Define projects by grouping together work items and bridges
- Determine cost and effectiveness of projects and the end result of performing the selected work on the selected bridges
- Dashboards to view higher level numbers and effects, while also being able to drill down to specific results and details



AASHTOWare Bridge Management

Project Details – Bridge View

	Bridge View	Bridg	e Map View	Work View							
	Bridge ID		Location			District	County	Facility	Precise Lon	Precise La	i i
~	04 07598		Jesse Owens N	Of Baseline		02	013	JESSE OWENS PKWY	-112.0689604	33.379799	3
	Action				Work Candidate	Base Utility	Utility	Utility Change	Estimated Cost	Benefit / Cost (\$k)	Cost (\$k) / Benefit
	Misc-Paint ID				04 07896-NMIV-045678	50.34	52.42	2.08	\$9,842,148.00	0.0002	\$4,732
	Joints-Rehabil	liatate			04 07896-NMIV-045678	50.34	52.39	2.05	\$3,002.00	0.6829	\$1
	Bridge-Replac	cement			04 07896-NMIV-045678	50.34	50.95	0.61	\$91,914.00	0.0066	\$151
	Paint-General				System Generated	50.34	51.48	1.14	\$196,200.00	0.0058	\$172
	Bearings-Repl	lace			04 07896-NMIV-045678	50.34	51.48	1.14	\$196,200.00	0.0058	\$172
	Deck-Resurfac	ce			04 07896-NMIV-045678	50.34	51.48	1.14	\$16,800.00	0.0679	\$ 15
	Deck-Seal				04 07896-NMIV-045678	50.34	51.48	1.14	\$96,300.00	0.0118	\$84
	Approach Rail	ling			System Generated	50.34	51.48	1.14	\$1,693,800.00	0.0007	\$1,486
	Approach Slab	b-Repair			System Generated	50.34	51.48	1.14	\$139,500.00	0.0082	\$122
	Channel-Repa	air Wash	outs/Erosion		04 07896-NMIV-045678	50.34	51.48	1.14	\$169,200.00	0.0067	\$148
>	04 07603		7TH ST S OF G	REENWAY PKWY		02	013	7TH STREET	-112.0654944	33.637033	
>	04 07878		DESERT FOOT	AT FRYE RD		02	013	DESERT FOOTHILLS	-112.0608444	33.298124	δ
>	04 07935	1	INT ELIOT RD 8	k 48TH ST		02	013	ELLIOT ROAD & 48TH	-111.973357844922	33.312307	7041172
>	04 08003	1	0.5 mi N of Bud	keye Rd		02	013	75th Ave	-112.2210993	33.445669	1
>	04 08508		4 MI N OF DUI	NLAP RD		02	013	25TH AVENUE	-112.1122222	33.571110	4
>	04 08511		1.5 MILE EAST	OF 24TH ST		02	013	CENTER FLYOVER	-112.0108333	33.436666	3
>	04 08529		SKY HARBOR A	IRPORT TERM 3		02	013	PARKING ENT&EXITS	-112.0069444	33.436110	7
>	04 08530		SKY HARBOR A	IRPORT TERM 3		02	013	PARKING ENT&EXIT	-112.0069444	33.434999	5
>	04 09175		19th Av N Of Ir	ndian Sch		02	013	19TH AVE	-112.0999107	33.499577	4
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AASHTOWare Bridge Management

Project Details – Map View



Action	Work Candidate	Base Utility	Utility	Utility Change	Estimated Cost	Benefit / Cost (\$k)	Cost (\$k) / Benefit
Misc-Paint ID	04 07896-NMIV-045678	50.34	52.42	2.08	\$9,842,148.00	0.0002	\$4,732
Joints-Rehabiliatate	04 07896-NMIV-045678	50.34	52.39	2.05	\$3,002.00	0.6829	\$1
Bridge-Replacement	04 07896-NMIV-045678	50.34	50.95	0.61	\$91,914.00	0.0066	\$151
Paint-General	System Generated	50.34	51.48	1.14	\$196,200.00	0.0058	\$172
Bearings-Replace	04 07896-NMIV-045678	50.34	51.48	1.14	\$196,200.00	0.0058	\$172
Deck-Resurface	04 07896-NMIV-045678	50.34	51.48	1.14	\$16,800.00	0.0679	\$15
Deck-Seal	04 07896-NMIV-045678	50.34	51.48	1.14	\$96,300.00	0.0118	\$84
Approach Railing	System Generated	50.34	51.48	1.14	\$1,693,800.00	0.0007	\$1,486
Approach Slab-Repair	System Generated	50.34	51.48	1.14	\$139,500.00	0.0082	\$122
Channel-Repair Washouts/Erosion	04 07896-NMIV-045678	50.34	51.48	1.14	\$169,200.00	0.0067	\$148



AASHTOWare Bridge Management

Main Project Screen

Br M Bridge Management				LINK									Datal	Welcome: Pontis base: BrM521 SQL Se Sampl Help ? Account Lo
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dit Project		Replace 12345		3234-3345 -55	Replacement	160.7	100	.025	3.56	Maintenance	2014	Proposed	Project Description	
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elete Project Lange Programs Lanage Funding	H Pro	ojects, 1 selected idge View Brid Bridge ID 40 07598 Action Misc-Paint ID Joints-Rehabilitate Bridge-Replacemen Paint-General Bearings-Replace Deck-Seal Approach Railing Approach Stab-Rep Channel-Repair War 40 07603	dge Map View Location Jesse Owens e tt air shouts/Erosior 71H ST SO	Work View	Work Candidate 04 07896-MMV-045 04 07896-MMV-045 04 07896-MMV-045 04 07896-MMV-045 04 07896-MMV-045 04 07896-MMV-045 System Generated 04 07896-MMV-045	District 02 Ba 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 50. 50. 50. 50. 50. 50. 50. 50.	County 013 34 34 34 34 34 34 34 34 34 34 34 34 34	Facility Utility U JESSE OW U U 52,42 U U 51,48 51,48 51,48 51,48 51,48 51,48 51,48 51,48 51,48 51,48 51,48 71H STRE	ENS PKWY tilly Change 2.05 0.61 1.14 1.14 1.14 1.14 1.14 1.14 1.14 1	Pre -111 Estimati \$9,842 \$3 \$195 \$196 \$196 \$196 \$1693 \$1693 \$139 \$1699 \$139 \$169	cise Lon 2.0689604 ad Cost 148.00 ,002.00 ,914.00 ,200.00 ,200.00 ,200.00 ,300.00 ,200.00 ,200.00 ,200.00 ,200.00	Benet	Precse Lat 33.3797993 ni / Cost (Sk) 0.0002 0.6829 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0057 33.637033	Cost (\$k) / Benef \$4,73 \$15 \$17 \$17 \$13 \$8 \$1,48 \$12 \$14 \$14
elete Project ange Programs anage Funding	11 Pro	ojects, 1 selected idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabilitatet Bridge-Replacemen Paint-General Bearings-Replace Deck-Resurface Deck-Seal Approach Railing Approach Slab-Rep Channel-Repair Wat 04 07603 04 07878	dge Map View Location Jesse Owens t t shouts/Erosion 7TH ST S OF DESRFT FOR DESRFT FOR	Work View N Of Baseline GREENWAY PKWY JT AT FRYE RD	Work Candidate 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045 94 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045	District 02 Ba 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 5678 50. 502 22	County 013 34 34 34 34 34 34 34 34 34 34 34 34 34	Facility U JESSE OW U JESSE OW U S242 S S239 S 5148 S S148 S	ENS PKWY tility Change 2.08 2.05 0.61 1.14 1.14 1.14 1.14 1.14 1.14 1.14 ET COTHILLS	Pre	cise Lon 2.0689604 ad Cost 148.00 ,002.00 ,914.00 ,200.00 ,200.00 ,300.00 ,500.00 ,500.00 ,200.00 2.0654944	Benet	Precise Lat 33.3797993 RL/ Cost (Sk) 0.0002 0.6829 0.0066 0.0058 0.0058 0.0058 0.0058 0.0057 0.0067 33.297033 33.2921246	Cost (\$k) / Benef \$4,73 \$15 \$17 \$17 \$17 \$18 \$1,48 \$12 \$148
elete Project ange Programs anage Funding	11 Pro	idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabilitatate Bridge-Replacemen Paint-General Bearings-Replace Deck-Seal Approach Stab-Rep Channel-Repair War 04 07678	dge Map View Location Jesse Owens at t shoutz/Erosion 71H ST S OF DESERT FOC DESERT FOC	Work View IN Of Baseline GREENWAY PKWY JT AT FRYE RD D & 48TH ST	Work Candidate 04 07898-NMV-045 04 07898-NMV-045 04 07898-NMV-045 04 07898-NMV-045 04 07898-NMV-045 04 07898-NMV-045 5ystem Generated 04 07898-NMV-045	District 02 88 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50,	County 013 360 Utility 34 34 34 34 34 34 34 34 34 34 34 34 34	Facility JESSE OW Utility U 52.42 5 51.48 5 51.48 5 51.48 5 51.48 5 51.48 5 51.48 5 51.48 5 51.48 5 51.48 5 51.48 5	ENS PKWY Lifty Change 2.08 2.05 0.61 1.14 1	Pre	cise Lon 2.0689604 ad Cost 148.00 ,002.00 ,914.00 ,200.00 ,200.00 ,200.00 ,500.00 ,200.00 2.0654944 1.97335784	Benet	Precise Lat 33.3797993 ft/ Cost (Sk) 0.0002 0.6829 0.0058 0.0058 0.0058 0.0067 33.637033 33.2981246 33.3281247	Cost (\$k) / Benet \$4,73 \$15 \$17 \$17 \$18 \$18 \$1,48 \$1,48 \$12 \$14
elete Project ange Programs anage Funding	11 Pro	ojects, 1 selected idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabilitatate Bridge-Replacemen Paint-General Bearings-Replace Deck-Seal Approach Railing Approach Railing Approach Sab-Rep. Channel-Repair Wat 04 07603 04 07878 04 00703	dge Map View Location Jesse Owens e tt shouts/Erosion 7TH ST S OF DESERT FOC INT ELIOT RI 0.5 mil N of I	Work View N Of Baseline GREENWAY PKWY JT AT FRY RD D & 48TH ST Suckeys Rd	Work Candidate 04 07896-INIV-045 04 07896-INIV-045 04 07896-INIV-045 04 07896-INIV-045 04 07896-INIV-045 04 07896-INIV-045	District 02 88 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 50, 50, 5678 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50,	Countly 013 36 Utility 34 34 34 34 34 34 34 34 34 34 34 34 34	Facility JESSE OW Ubinity U 52.42 U 52.43 U 51.48 U ELUO RK DESKTF F ELUO RK 75th Ave	ENS PKWY tility Change 2.08 2.05 0.61 1.14 1.14 1.14 1.14 1.14 1.14 1.14 1.14 ET DOTHILLS DAD & 48TH	Pre 11 Estimate \$9,842 \$3 \$91 \$196 \$196 \$196 \$196 \$196 \$169 \$199 \$119 \$199 \$19	cise Lon 2.0689604 ad Cost 1.148.00 002.00 914.00 200.00 200.00 300.00 500.00 500.00 2.0654944 2.0608444 2.0608444 2.9733578 2.2210993	Bene	Precise Lat 33.3797993 ft / Cost (\$k) 0.0002 0.6829 0.0056 0.0058 0.0077 0.0067 33.637033 33.2981246 33.31230770 33.445691	Cost (\$k) / Benef \$4,73 \$15 \$17 \$17 \$17 \$1 \$5 \$1,48 \$1,48 \$12 \$14
elete Project lange Programs anage Funding	11 Pro	ojects, 1 selected idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabilitatae Bridge-Replacemen Paint-General Bearings-Replace Deck-Resulface Deck-Seal Approach Slab-Rep Deck-Seal Approach Slab-Rep Channel-Repair Was 04 07678 04 07678 04 00003 04 00508	dge Map View Location Jesse Owen t t shouts/Erosion 7TH ST S OF DESERT FOC INT ELIOT RI 0.5 mi N of I 4.4 MI N OF	Work View s N Of Baseline GREENWAY PKWY IT AT FRYE RD D & 48TH ST SUCKEYE Rd JUNLAP RD	Work Candidate 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045 04 07896-NMV-045	015474 02 86 5678 50, 5678 50, 50, 5678 50, 50, 50, 50, 50, 50, 50, 50, 50, 50,	County 013 380 Utility 34 34 34 34 34 34 34 34 34 34 34 34 34	Facility JESSE OW JESSE OW 52.39 50.95 51.48 51.48 51.48 51.48 51.48 51.48 51.48 51.48 DESRT F ELUOT R ELUOT R 75th Ave 25TH AVI	ENS PKWY thifty Change 2.08 2.05 0.61 1.14 1.14 1.14 1.14 1.14 1.14 ET COTHILLS DAD & 48TH ENUE	Pre -11 Estmate \$9,842 \$3 \$9 \$196 \$196 \$196 \$169 \$169 \$169 \$169 \$	cise Lon 2.0689604 el Cost 1,148.00 ,002.00 ,200.00 ,200.00 ,200.00 ,200.00 2.0050944 2.0608444 2.0608444 1.9733778-	Benet	Precise Lat 33.3797993 fit / Cost (\$k) 0.0002 0.6829 0.0058 0.0058 0.0079 0.0118 0.0007 0.0066 33.637033 33.2981246 33.31297070 33.31297070 33.31297070 33.31297070	Cost (\$k) / Benef \$4,73 \$15 \$15 \$17 \$17 \$17 \$18 \$148 \$148 \$12 \$14 \$142 \$14 \$172
elete Project Lange Programs Lanage Funding	11 Pro	ojects, 1 selected idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabiliatate Bridge-Replacemen Paint-General Bearings-Replace Deck-Resulface Deck-Seal Approach Slab-Rep. Channel-Repair Wax 04 07638 04 07878 04 07935 04 08508	dge Map View Location Jesse Owen e nt shouts/Erosion 71H ST S OF DESERT FOC INT ELIOT RI 0.5 mi N of I 4. MI N OF I 1.5 MILE EAS	Work View s N Of Baseline GREENWAY PKWY JT AT FRYE RD D & 48TH ST Buckeye Rd XUNLAP RD JT OF 24TH ST	Work Candidate 04 07398-NMV-045 04 07398-NMV-045 04 07398-NMV-045 04 07398-NMV-045 04 07398-NMV-045 04 07398-NMV-045 System Generated 04 07398-NMV-045	District 02 5678 50. 50. 50. 5678 50. 50.0 50. 50.0 50. 50.0 50. 50.0 50. 50.0 50. 50.0 50. 50.0	County 013 34 34 34 34 34 34 34 34 34 34 34 34 34	Facility JESSE OW Utility 52.42 51.48 51.48 51.48 51.48 51.48 51.48 51.48 51.48 51.48 DESERT F ELLIOT R 75th Ave 25TH AVI CENTER F	TENS PKWY titity Change 2.08 2.05 0.61 1.14 1.14 1.14 1.14 1.14 1.14 ET DOTHILLS DAD & 48TH NUE LYOVER	Pre -11. Estimate \$9,842 \$3 \$19 \$196 \$196 \$196 \$169 \$169 \$169 \$169	cise Lon 2.0659604 aid Cost 1,48.00 2,000,200 2,000,200 2,000,000	Benel	Precise Lat 33.3797993 ht / Cost (5k) 0.0005 0.0058 0.0058 0.0059 0.007 0.0082 0.0082 33.3291246 33.3295701 33.4356661 33.4366663	Cost (\$k) / Benef \$4,73 \$15 \$15 \$17 \$17 \$17 \$18 \$1,48 \$148 \$12 \$14 \$14172
elete Project tange Programs tanage Funding	11 Pro	ojects, 1 selected idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabilitate Bridge-Replacemen Paint-General Bearings-Replace Deck-Seal Approach Railing Approach Slab-Rep. Channel-Repair War 04 07603 04 07603 04 07603 04 07878 04 06503 04 08510 04 08510	dge Map View Location Jesse Owen at t shouts/Erosion 71H ST S OF DESERT FOC INT ELIOT RI 0.5 mi N of I 1.5 MILE BA' SKY HARBOI	Work View s N Of Baseline GREENWAY PKWY JT AT FRYE RD D & 48TH ST Juckeye Rd YUNLAP RD T OF 24TH ST R AIRPORT TERM 3	Work Candidate 04 07398-MMV-045 04 07398-MMV-045 04 07398-MMV-045 94 07398-MMV-045 04 07398-MMV-045 04 07398-MMV-045 System Generated 04 07398-MMV-045	District 02 85 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 5678 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50, <	County 013 34 31 013 013 013 013	Faculty JESSE OW JESSE OW S239 50.95 51.48 51.48 51.48 51.48 51.48 51.48 51.48 DESERT F ELUOT R 75th Ave 25TH AVE CENTER F PARKING	ENS PKWY tility Change 2.05 0.61 1.14	Pre	cise Lon 2.46 Cost 1.48.00 .002.00 .002.00 .002.00 .002.00 .002.00 .000.000 .000.00 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .000.000 .0000.000 .0000.0000 .0000.0000 .0000.0000 .0000.0000 .0000.0000 .0000.0000 .0000.0000 .00000 .0000.0000 .0000.0000 .000000	Benet	Precise Lat 33.3797993 RL/ Cost (Sk) 0.0002 0.6829 0.0058 0.0058 0.0058 0.0057 0.0067 33.637033 33.2281246 33.3230770 33.4456691 33.4356693 33.4356631 33.4366631 33.4366631	Cost (5k) / Benef \$4,73 \$15 \$17 \$17 \$1 \$1,48 \$1,48 \$12 \$14 \$12 \$14
Delete Project dange Programs danage Funding	11 Pro	Idge View Brid Bridge ID 04 07598 Action Misc-Paint ID Joints-Rehabilitatate Bridge-Replacemen Paint-General Paint-General Paint-General Paint-General Approach Stab-Rep Channel-Repair War 04 07935 04 07935 04 08003 04 07935 04 08508 04 08508	dge Map View Location Jesse Owen at shouts/Erosion 7TH ST S OF DESERT FOC INT ELIOT R 0.5 mi N of I 1.5 MI LE EAS SKY HARBO SKY HARBO	Work View IN OF Baseline GREENWAY PKWY GREENWAY PKWY JAT FRYE RD D & 48TH ST Buckeye Rd JUNLAP RD ST OF 24TH ST R AIRPORT TERM 3 R AIRPORT TERM 3	Work Candidate 04 07896-IMIV-045 04 07896-IMIV-045 04 07896-IMIV-045 04 07896-IMIV-045 04 07896-IMIV-045 04 07896-IMIV-045 System Generated 04 07896-IMIV-045	District 02 5673 50, 5673 50, 5678 50, 50, 20, 50, 20, 50, 20, 50, 20, 50, 20, 50, 20, 50, 20, 50, 20, 50, 20,<	County 013 34 35 36 37 38 39 313 313 313	Facility JESSE OW JESSE OW Utility Utility 52.42 5 5 50.95 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 5 5 51.48 7 5 51.48 5 5 51.48 5 5 51.48 7 5 51.48 7 5 6 7 5 7 5 4 2 2 7 5 4 2 7 5 4 2 7 4 4 2 7 4 4 2 7	ENS PKWY titity Change 2.08 2.05 0.61 1.14 ET DOOTHILLS DAD & 48TH NUE ENT&EXITS ENT&EXITS ENT&EXITS	Pre 111 Estimate \$9,842 \$3 \$91 \$196 \$166 \$166 \$166 \$169 \$169 \$169	cise Lon ed Cost ed Cost (148.00 (002.00) (002.00 (002.00) (002.0	Benet	Precise Lat 33.3797993 ft/ Cost (Sk) 0.0002 0.6829 0.0058 0.0058 0.0058 0.0067 0.0082 0.0067 33.637033 33.2981246 33.435691 33.435691 33.4356107 33.4356107 33.43549996	Cost (\$k) / Bene \$4,73 \$15 \$17 \$17 \$17 \$18 \$140 \$12 \$14 \$12 \$14

AASHTOWare Bridge Management www.AASHTOWareBridge.com



Project Details - Summary

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Bridge Query		Project ID:	2235-5234-19	Alternate ID:			Project Status: Planning	g	Project URL:			
roiect Details		Project Name:		Project Type: Paint			Year Start:	Year End:	Created by:	John Smith	Date: 5/31/2	014
	Pro	oject Description:										
ad Project												
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	Pro	oject Cost and Bene	fits									
		Indirect Cost	E	Project Cost			Performance Measure	Average Benefit	Median Benefi	t Total Benefit		
	Ca	lculated: 20.0		000 Other Costs:			Health Index	20.31	21.71	321.32		
		Entered:	% Indirect Cost: \$1,000	000 Total Cost: \$	000 000 000		Condition	15.21	16.02	214.64		
		Lintorour		10141-00011 4	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Risk	4.56	4.5	40.42		
							Mobility	14.84	15.00	63.24		
	Brid	lge and Work Summ	nary				Life cycle Cost TOTAL BENEFIT	23.54	23.50	267.43 1,483.43		
	Brid	Ige and Work Summ Bridge View	nary Map View				Life cycle Cost	23.54	23.50	267.43 1,483.43		
	Brid	Ige and Work Summ Bridge View Bridge ID	tary Ap View Location	Base I	Utility	Utility	Life cycle Cost TOTAL BENEFIT Utility Change	Estimated Cost	23.50 Ben	267.43 1,483.43	Cost	: (\$k) / Benef
	-Brid	Ige and Work Summ Bridge View N Bridge ID 04 07598	Aap View Location Jesse Owens N Of Baseline	Base 50.34	Utility (Utility 50.44	Life cycle Cost TOTAL BENEFIT Utility Change 10.04	Estimated Cost \$12,34,000	23.50 Ben	267.43 1,483.43 efit / Cost (\$k) .1245	Cost	: (\$k) / Benef \$2,136
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	-Brid	Ige and Work Summ Bridge View 1 Bridge ID 4 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Realparem	hary Map View Location Jesse Owens N Of Baseline te	Base 1 50.34 Work Candidate 04 07896-NMV-045678 04 07896-NMV-045678	Utility 6 Base Utility 50.34 50.34 50.34	Utility 50.44 52.4 52.5 50.5	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 by Utility Change 2 2.05 9 2.05 5 0.61	23.54 Estimated Cost \$12,345,000 Estimated Co \$9,842,146. \$3,002.0 \$9,942,146. \$3,002.0 \$9,942,146. \$3,002.0 \$9,942,146.5 \$1,000,000,000,000,000,000,000,000,000,0	23.50 Ben st Be	267.43 1,483.43 efit / Cost (\$k) .1245 metit / Cost (\$k) 0.0002 0.6829 0.0066	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,73 \$ \$ \$ 5 \$ 5
	-Brid	Ige and Work Summ Bridge View 1 Bridge ID C 04 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacema	hary dap View Location Jesse Owens N Of Baseline te ent	Base I 50.34 Work Candidate 04 07898-NMN-045678 04 07898-NMN-045678 System Generated 04 07898-NMN-045678	Utility 6 Base Utility 50.34 50.34 50.34 50.34	Utility 50.44 52.4 52.2 50.5 51.4	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 12 2.08 19 2.05 15 0.61 114	Estimated Cost \$12,34,000 Estimated Cost \$3,842,148,000 Estimated Co \$9,842,148,000 \$3,942,148,0000\$}	23.50 Ben st Ben 0 0 0	267.43 1,483.43 affi / Cost (\$k) .1245 .1245 .0002 0.6829 0.0058	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,73; \$15; \$15;
	-Brid	Ige and Work Summ Bridge View Bridge ID O 407598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace	Aap View Location Jesse Owens N Of Baseline te	Base 50.34 Work Candidate 04 07896-NMV-045678 04 07896-NMV-045678 System Generated 04 07896-NMV-045678 04 07896-NMV-045678 04 07896-NMV-045678	Utility 6 Base Utility 50.34 50.34 50.34 50.34 50.34	Utility 50.44 52.4 52.5 50.5 51.4 51.4	Life cycle Cost TOTAL BENEFIT 10.04 ty Utility Change 10.04 ty Utility Change 12 2.08 19 2.05 15 0.61 18 1.14	Estimated Cost \$12,345,000 Estimated Cost \$39,842,148,0 \$3,002 \$91,914.0 \$196,200.0 \$196,200.0	23.50 Ben st Be 0 0 0 0 0	267.43 1,483.43 efft / Cost (\$k) .1245 mefit / Cost (\$k) 0.0002 0.6829 0.0058 0.0058	Cost	(5k) / Benef \$2,136 (5k) / Benef \$4,73 \$ \$15; \$15; \$17; \$17;
	-Brid	Ige and Work Summ Bridge View M Bridge ID Od 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Resurface	Aap View Location Jesse Owens N Of Baseline te ent	Base 50.34 Work Candidate 04 07395-NMV-045678 04 07395-NMV-045678 System Generated 04 07395-NMV-045678 System Generated 04 07395-NMV-045678 System Generated	Utailty Base Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 30.44 52.4 50.5 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT 10.04 ty Lility Change 10.04 ty Lility Change 2.05 5 5 0.61 18 1.14 18 1.14	Estimated Cost \$12,345,000 Estimated Cost \$12,345,000 Estimated Co \$9,842,148,0 \$3,002,0 \$9,944,148,0 \$3,002,0 \$19,940,0 \$19,6200,0 \$10,620	23.50 Ben st Be 0 0 0 0 0 0 0	267.43 1,483.43 afit / Cost (\$k) .1245 .1245 .0002 0.6829 0.0058 0.0058 0.0058	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,73 \$15 \$15 \$17 \$17 \$17
	-Brid	ge and Work Summ Bridge UD Od 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replace Paint-General Bearings-Replace Deck-Resurface Deck-Seal	hary Aap View Location Jesse Owens N Of Baseline te ent	Base 50.34 Work Candidate 04 07395-MMV-045678	Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 30.44 52.4 50.5 51.4 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT 10.04 ty Utility Change 10.04 ty Utility Change 2 2 2 2 2 0 6 10.04 ty 2 2 2 0 6 10.04 ty 10 ty 10 ty 10 ty 10 ty 10 ty 10 ty 10 ty 10	23.54 23.54 Estimated Cost \$12,345,000 Estimated Co \$9,842,148.0 \$9,842,148.0 \$9,842,148.0 \$91,914.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,800.0 \$196	23.50 Ben 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 afit / Cost (\$k) .1245 .1245 .1245 .0002 0.6829 0.0066 0.0058 0.0058 0.0058 0.0679 0.0118	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,73 \$15 \$15 \$17 \$17 \$17 \$11 \$8
	-Brid	ge and Work Summ Bridge View 1 Bridge ID Od 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Resurface Deck-Seal Approach Railing	hary Location Jesse Owens N Of Baseline te ent	Base 50.34 Work Candidate 04 07896-NMI/-045678 04 07896-NMI/-045678 04 07896-NMI/-045678 04 07896-NMI/-045678 04 07896-NMI/-045678 System Generated 04 07896-NMI/-045678 System Generated 04 07895-NMI/-045678 System Generated 04 07895-NMI/-045678 System Generated	Utility 8ase Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 30.44 52.4 52.5 50.9 51.4 51.4 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 22 2.08 19 2.05 15 0.61 18 1.14 18 1.14 18 1.14 18 1.14	23.54 23.54 Estimated Cost \$12,345,000 \$9,842,148.0 \$9,942,148.0 \$9,942,148.0 \$196,200.0 \$196,	23.50 Benn st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (5k) .1245 mefit / Cost (5k) 0.0002 0.0829 0.0066 0.0058 0.0058 0.0058 0.007	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,73; \$15; \$15; \$17; \$12; \$88 \$1,488
	-Brid	ge and Work Summ Bridge View M Bridge ID O 407598 Action Misc-Panit ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Seal Approach Railing Approach Slab-Re	Ap View Location Jesse Owens N Of Baseline te ent	Base 50.34 Work Candidate 04 07896-NMN/-045678 04 07896-NMN/-045678 System Generated 04 07896-NMN/-045678	Utility Base Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility Utility 30.44 Utili 52.4 52.5 50.5 51.4 51.4 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 22 2.08 19 2.05 15 0.61 18 1.14 18 1.14 18 1.14 18 1.14 114	23.54 23.54 Estimated Cost \$12,345,000 Estimated Co \$9,842,148.0 \$9,942,148.0 \$19,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,300.0 \$196,300.0 \$196,300.0 \$19,839,800.0 \$139,950.0 \$139,550.0 \$13	23.50 Ben st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (\$k) .1245 mefft / Cost (\$k) 0.0002 0.6829 0.0058 0.0058 0.0058 0.0058 0.0079 0.0118 0.0007 0.0082	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,733 \$15 \$15; \$17; \$11; \$88 \$1,488 \$12;
	-Brid	ge and Work Summ Bridge View M Bridge D Od 07598 Action Misc-Paint ID Joints-Rehabiliat Bridge-Replacem Paint-General Bearings-Replace Deck-Seal Approach Railing Approach Railing Approach Railing	Ap View Location Jesse Owens N Of Baseline te ent spair (ashouts/Erosion	Base 50.34 Work Candidate 04 07896-NMN-045678 04 07896-NMN-045678 System Generated 04 07896-NMN-045678 04 07896-NMN-045678 04 07896-NMN-045678	Utatky Ease Utatky	Utility 52.4 50.44 52.4 50.5 50.5 51.4 51.4 51.4 51.4 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 2 2.08 9 2.05 5 0.61 18 1.14 18 1.14 18 1.14 18 1.14 114 18 1.14	23.54 23.54 Estimated Cost \$12,345,000 Estimated Cos \$9,842,148.0 \$3,022 \$19,914 \$196,200.0 \$196,200.0 \$196,300.0 \$1,693,800.0 \$1,493,800.0 \$1,	23.50 Ben st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (\$k) .1245 mefft / Cost (\$k) 0.0002 0.6829 0.0058 0.0058 0.0058 0.0057 0.0018 0.0007	Cost	(5k) / Benef \$2,136 (5k) / Benef \$4,73 \$15 \$15 \$17 \$17 \$17 \$17 \$11 \$8 \$1,48 \$1,48 \$1,21 \$12 \$14
	-Brid	Bridge View 1 Bridge View 1 Bridge D 4 C4 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Resurface Deck-Resurface Deck-Seal Approach Railing Approach Slab-Re Channel-Repair W	Ap View Location Jesse Owens N Of Baseline te ent (ashouts/Erosion TTH ST S OF GREENWAY PKWY	Base 50.34 Work Candidate 04 07896-NIMV-045678 04 07896-NIMV-045678 System Generated 04 07896-NIMV-045678 04 07896-NIMV-045678	Utility Base Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 50.44 50.44 52.4 50.5 51.4 51.4 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT 10.04 by Utility Change 10.04 by Utility Change 2 2.08 19 2.05 15 0.61 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14	23.54 23.54 Estimated Cost \$12,345,000 Estimated Co \$9,942,146 \$3,002(\$19,942,146 \$196,200(\$196,200(\$196,200(\$1,693,800(23.50 Ben 51 Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (5k) .1245 mefit / Cost (5k) 0.0002 0.0005 0.0058 0.0058 0.0058 0.0058 0.0057 0.0118 0.0007	Cost	(5k) / Benef \$2,136 (5k) / Benef \$4,73 \$15 \$15 \$177 \$177 \$177 \$17 \$18 \$84 \$1,480 \$122 \$144
	-Brid	Bridge View P Bridge View P Bridge ID O 407598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Resurface Deck-Seal Approach Slab-Repliv Channel-Repair W 0 407603 O 407878	Aap View Aap View Location Jesse Owens N Of Baseline te ent tage train Th ST S OF GREENWAY PKWY DESERT FOOT AT FRYE RD	Rase 50.34 Vork Candidate 04 07896-NMV-045678 04 07896-NMV-045678 System Generated 04 07896-NMV-045678 System Generated 04 07896-NMV-045678 System Generated 04 07896-NMV-045678 System Generated 04 07896-NMV-045678 04 07896-NMV-045678 04 07896-NMV-045678 04 07896-NMV-045678 04 07896-NMV-045678	Utility 50.34	Utility 50.44 50.44 52.4 52.3 50.0 51.4 51.4 51.4 51.4 51.4 51.4 51.4 51.4	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 by Utility Change 22 2.08 39 2.05 35 0.61 38 1.14 38 1.14 38 1.14 38 1.14 38 1.14 38 1.14 38 1.14 38 1.14	23.54 23.54 Estimated Cost \$12,345,000 Estimated Co \$9,942,146 \$3,002.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$1,693,800.0 \$	23.50 Benn st Benn 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (\$k) 1245 mefit / Cost (\$k) 0.0002 0.0066 0.0058 0.0058 0.0058 0.0058 0.0057 0.0002 0.0007 0.0002 0.0007	Cost	(3k) / Benef \$2,136 (3k) / Benef \$4,73 \$15 \$15; \$17; \$17; \$17; \$17; \$14; \$8; \$1,48; \$1,48; \$1,42; \$144; \$12; \$144; \$12; \$144; \$12; \$144; \$2,136;
	-Brid	Bridge View (*) Bridge View (*) Bridge ID O 407598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Resurface Deck-Seal Approach Slab-Re Channel-Repair W O 407603 O 407878	Aap View Location Jesse Owens N Of Baseline te ent (ashouts/Erosion 7TH ST S OF GREENWAY PKWY DESERT FOOT AT FRYE RD INT ELUOT RD & 48TH ST	Base 50.34 Vork Candidate 04 07396-NMV-045678 04 07396-NMV-045678 System Generated 04 07396-NMV-045678 04 07396-NMV-045678 System Generated 04 07396-NMV-045678	Utaity Ease Utaity 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 80.44 52.4 52.3 50.0 51.4 51	Life cycle Cost TOTAL BENEFIT 10.04 ty Utility Change 10.04 ty Utility Change 22 2.05 10.04 10.04 12 2.05 15 0.61 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 11 10 10 10 10 10 10 10 10 10	Estimated Cost \$12,354 \$12,345,000 Estimated Co \$9,842,146, \$3,002 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$169,200.0 \$17,400.0	23.50 Ben 51 Be 00 00 00 00 00 00 00 00 00 00 00 00 00	267.43 1,483.43 afit / Cost (\$k) .1245 .1245 .0002 0.6829 0.0058 0.0058 0.0058 0.0059 0.0118 0.0067 0.0118 0.0007 0.0182 0.0067 .1245 .1245	Cost	(5k) / Benef \$2,136 (3k) / Benef \$4,73 \$15 \$17 \$17 \$17 \$18 \$1,48 \$1,48 \$1,48 \$1,48 \$2,136 \$1,428
	-Brid	Bridge View () Bridge Uiew () Od 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replacem Paint-General Bearings-Replacem Paint-General Deck-Resurface Deck-Seal Approach Stab-Re Channel-Repair W Od 07603 0 40 07935 0 40 0935	Aap View Location Jesse Owens N Of Baseline te ent tage type type type type type type type typ	Base 50.34 Work Candidate 04 07396-MMV-045678	Utaity Ease Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 30.44 52.4 52.5 50.5 51.4 51.4 51.4 51.4 51.4 51.4 51.4 51	Life cycle Cost TOTAL BENEFIT 10.04 ty Utility Change 10.04 ty Utility Change 205 5 0.61 10.04 10.04 11.14	23.54 23.54 23.54 Estimated Cost \$12,345,000 Estimated Co \$9,842,148.0 \$98,842,148.0 \$98,200.0 \$196,200.0 \$197,245,000 \$197,245,0	23.50 Ben t Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 afit / Cost (\$k) .1245 .1245 .1245 .0002 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0057 .1245 .2134 .1245 .2134 .1245	Cost	(5k) / Benef \$2,136 (3k) / Benef \$4,73 \$15 \$15 \$17 \$17 \$17 \$18 \$148 \$1,428 \$2,136 \$1,428 \$2,136
	-Brid	Bridge View () Bridge View () Bridge ID () Content of the second of the	Ap View Location Jesse Owens N Of Baseline te ent tage train TH ST S OF GREENWAY PKWY DESERT FOOT AT FRYE RD INT ELIOT RD & 48TH ST 0.5 mi N of Buckeye Rd A MI N OF DUNLAP RD	Base 50.34 Vork Candidate 50.34 04 07395-MMV-045678 04 07395-MMV-045678 04 07395-MMV-045678 04 07395-MMV-045678 04 07395-MMV-045678 59346 04 07395-MMV-045678 59346 04 07395-MMV-045678 50.34	Utailty Ease Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 30.44 52.4 52.5 50.5 51.4 50.4 50	Life cycle Cost TOTAL BENEFIT 10.04 ty Utility Change 10.04 ty Utility Change 2.05 5.0.61 10.14 10.04 11.14 10.14 11.14	23.54 23.54 23.54 Estimated Cost \$12,345,000 \$9,842,148,0 \$9,842,148,0 \$9,842,148,0 \$19,620,0 \$196,200,0 \$196,200,0 \$196,200,0 \$1,693,800,0 \$1,693,800,0 \$1,693,800,0 \$1,693,800,0 \$1,2,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$12,345,000 \$3,874,000 \$3,87	23.50 Benv st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 afit / Cost (\$k) .1245 .1245 .0.0002 0.0829 0.0058 0.0057 0.0058 0.0057 0.0	Cost	(5k) / Benef 52,136 (5k) / Benef 54,733 5153 5153 5177 517 517 514 5148 51,488 51,488 51,488 51,428 52,136 51,428 52,136
	-Brid	ge and Work Summ Bridge View (*) Bridge ID < 04 07598 Action Misc-Paint ID Joints-Rehabiliata Bridge-Replacem Paint-General Bearings-Replace Deck-Resurface Deck-Seal Approach Slab-Rd Channel-Repair W 04 07603 04 07878 04 07878 04 08003 04 08518 04 08518	Ap View Location Jesse Owens N Of Baseline te ent fashouts/Erosion TH ST S OF GREENWAY PKWY DESERT FOOT AT FRVE RD UT ELOT RD & 48TH ST 0.5 mi N of Buckeye Rd 4 MI N OF DUNLAP RD 1.5 MILE EAST OF 24TH ST CVV UNAPROPEDT FEM 21	Base 50,34 Work Candidate 04 07395-NMM-045578 04 07395-NMM-045578 04 07395-NMM-045578 04 07395-NMM-045578 System Generated 04 07595-NMM-045578 System Generated 04 07595-NMM-045578 System Generated 04 07595-NMM-045578 System Generated 04 07595-NMM-045578 50,34 62,24 50,34 62,24 50,34 62,24 50,34 62,24 50,34 62,24 50,34 62,24 50,34	Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility Utility 50.44 Utilit 52.4 51.4 51.4 51.4 51.4 51.4 51.4 51.4 51	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 2 2.08 9 2.05 5 0.61 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 19 1.14 10.04 13.04 10.04 13.04 10.04 13.04	23.54 23.54 23.54 Estimated Cost \$12,345,000 \$9,842,148.0 \$9,942,148.0 \$19,500.0 \$19,620.0 \$10,620.0 \$10,620.0 \$12,345,000 \$12,345,	23.50 Benv st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (5k) .1245 mefit / Cost (5k) 0.0002 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0057 .1245 .2134 .1245 .2134 .1245 .2134	Cost	(5k) / Benet 52,136 (5k) / Benet 54,73 515 515 517, 517, 517, 511, 588 51,488 51,488 51,488 51,428 52,136 51,428 52,136 51,428 52,136 51,428 52,136 51,428 51,428 52,136 51,428 51,548 51,558 51,5585555555555555555555555555
	-Brid	Bridge View (*) Bridge ID Bridge ID Comparison of the second se	Ap View Location Jesse Owens N Of Baseline te ent Sathouts/Erosion TH SI S OF GREENWAY PKWY DESERT FOOT AT FRYE RD INT ELIOT RD & 48TH ST 0.5 mi N of Buckeye Rd A MI N OF DUNLAP RD 1.5 MILE EAST OF 24TH ST SKY HARBOR AIRPORT TEMM 3	Base 50.34 Work Candidate 04 07386-NMI/-045678 04 07386-NMI/-045678 System Generated 04 07398-NMI/-045678 Solation 04 07398-NMI/-045678 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34	Utility Ease Utility 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34 50.34	Utility 50.44 50.44 52.4 51.4 51.4 51.4 51.4 51.4 51.4 51.4 51	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 22 2.08 19 2.05 10.04 11.	23.54 23.54 23.54 Estimated Cost \$12,345,000 \$9,842,148.0 \$9,942,148.0 \$196,200.0 \$197,345,000 \$192,345,000 \$3,874,000 \$3,874,000 \$3,874,000 \$3,874,000 \$3,874,000 \$3,274,0	23.50 23.50 Ben st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (\$k) .1245 mefit / Cost (\$k) .1245 0.0002 0.0028 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0058 0.0067 0.0082 0.0067 1245 2134 .1245 .2134 .1245	Cost	(\$k) / Benef \$2,136 (\$k) / Benef \$4,73 \$ \$15 \$17, \$17, \$17, \$17, \$17, \$12, \$14, \$14,488 \$1,488 \$1,428 \$2,136 \$1,428 \$2,136 \$1,428 \$2,136
	Brid	Bridge View N Bridge View N Bridge D Addge D Addge D Addge D Misc-Paint ID Joints-Rehabiliat Bridge-Replacem Paint-General Bearings-Replace Deck-Seal Approach Railing Approach Slab-Re Channel-Repair W O 407603 04 07603 04 07878 04 07878 04 08578 04 08508 04 08529 04 08530 04 08530	Ap View Ap View Location Jesse Owens N Of Baseline te ent Th St S OF CREENWAY PKWY DESERT FOOT AT FRY RD INT ELIOT RD & 48TH ST O.5 mi N of Buckeye Rd A MI N OF DUNLAP RD I.5 MILE EAST OF 24TH ST SKY HARBOR AIRPORT TERM 3 SKY HARBOR AIRPORT TERM 3	Base 50.34 Work Candidate 04 07895-NIMV-045678 04 07895-NIMV-045678 System Generated 04 07895-NIMV-045678 System Generated 04 07895-NIMV-045678 System Generated 04 07895-NIMV-045678 System Generated 04 07895-NIMV-045678 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34 62.34 50.34	Utarty 6	Utility 52.4 52.4 52.5 50.5 51.4 51.4 51.4 51.4 51.4 51.4 51.4 51	Life cycle Cost TOTAL BENEFIT Utility Change 10.04 ty Utility Change 2 2.08 9 2.05 5 0.61 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 18 1.14 19 1.14 10.04 13.04 10.04 13.04 10.04 13.04 10.04 13.04	23.54 23.54 23.54 Estimated Cost \$12,345,000 \$9,842,148.0 \$19,920.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$196,200.0 \$197,245,000 \$12,345,000 \$13,874,000 \$12,345,000 \$13,874,000 \$12,345,000 \$13,874,000 \$12,345,000 \$12,345,000 \$13,874,000 \$12,345,000 \$13,874	23.50 Ben st Be 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	267.43 1,483.43 efft / Cost (\$k) .1245 mefft / Cost (\$k) 0.0002 0.0058 0.0058 0.0058 0.0058 0.0058 0.0057 0.0018 0.0007 0.0082 0.0067 1245 2134 .1245 2134 .1245 2134	Cost	(5k) / Bener \$2,136 (5k) / Bener \$4,73 \$ \$15 \$15 \$17 \$17 \$17 \$17 \$18 \$2,136 \$1,428 \$1,42

BrM

Project Details – Analysis

nu Br	idges Reports Admin Inspection Gateway	y Analysis	Projects						
List	Save Save & Close Split	Cancel							
ige Layouts S	elected Project: New Project		-						
ige Filters	Summary Analysis Management								
roject									
a Brainst	Selected Bridge: 04 07603 v								
	Bridge Work Description								
ge duery	Bhuge work beschption.								
ect Details									
Project									
e Projects	Description				Conditions	3			
	Route: 00000 N District: District 2 CC	lilepoint: mi County: Mari	icona		Deck: Substr:	4 Poor 7 Good	Superstr: Culvert:	 6 Satisfactory N N/A (NBI) 	
roject	Owner: City/Municipal Hwy Agenc A	vrea: 02B	- Paul Goldsmith		Structure:	8 Protected	Deck Ind	ex: 50.07	
Programs	Material: 5 Prestressed Concrete R Scour: 6 Calcs not made	tesp: City/	Municipal Hwy Ag	enc	Superstr Ind	ex: 45.89	Substr In Structure	dex:	
Funding		caigin. 00 W				<u>.</u>	Sudetare	42.10	
unung	Current Scaled Performance				Recent Con	npleted Work		Year	Cost
	Condition: 59.32 R	disk: 53.8	11		No recently o	ompleted work found.			
	Lifecycle: N	lobility: 34.2	2						
	Sufficiency								
	Rating: 97.5 S	D/FO: Not	Deficient						
	Work Candidates Existing for the Selected Bridge Se	elected Work	All Work	_					
	Work Candidate		ι	Itility	Utility Change	Cost	Benefit / Cost (\$k)	Cost (\$k) / Benefit	Action Y
	Do Nothing		5	0.34		\$45,000	.156	\$12	0
	04 0759-JQSX-031914-6ABA193714 - Approach Railing-	Repair	5	2.5	2.16	\$125,000	.032	\$0	0
	04 0759-NIMO-042114-E90D693A52 - Approach Railing	g-Repair	5	2.5	2.16	\$25,000	.141	\$0	0
	04 0759-NIMO-091313-E2A8C9DA58 - Approach Slab-F	Repair	5	1.48	1.14	\$150,000	.114	\$9	0
	A-DOT001-057F6A47-0000006A - Bridge Rail-Repair		5	0.34	0	\$75,000	.176	\$7	0
	A-DOT001-057F6A47-0000006D - Deck-Rehab		5	0.34	0	\$100,000	.198	\$10	0
	K < 1 > > Page size: 10 -							6 ite	ms in 1 pag
	Effects on Each Utility Criterion			Fffec	ts on Each Element				
	Category name	Before WC	After WC		Element		Str Env	Condition	ffect
	Total Utility	50.34	52.5		Liomont		Unit	Contaition	
	Condition	59.32	61.88	>	(12) Re Concrete Deck		0 Low (2)		
	Deck	42	98		(12) Re Concrete Deck		0 Mod. (3)		
	Superstructure	81	81		(38) Re Concrete Slab		0 Low (2)		
	Substructure	91	91		(65) Other Slab		0 Ben. (1)		
	Scour	58	58		(116) Re Conc Stringer		0 Ben. (1)		
	Element ratings	52.44	62.89		(144) Re Conc Arch		0 Ben. (1)		
	(12) Reinforced Concrete Deck	32.04	48.46		(320) Pre Conc Appr Sla	ab	0 Low (2)		
	(38) Reinforced Concrete Deck	31.98	48.42		(321) Re Conc Approac	h Slab	0 Low (2)		
	(65) Other Slab	100	100	>	(331) Re Conc Bridge R	ailing	0 Low (2)		
	(116) Reinforced Concrete Closed Web/Box Girde	er 100	100		(12) Re Concrete Deck		1 Mod. (3)		
	(320) Prestress Concrete Approach Slab	10.66	10.66	Deter	rioration				
	(321) Reinforced Concrete Approach Slab	10.66	10.66			idae		Element	
	(331) Reinforced Concrete Bridge Railing	28.42	100		в	luge	100	ciement	
	(520) Deck/Slab Protection Systems	100	100		90	🔵 Actio	n 100 90		Action
	(521) Concrete Protective Coating	10.66	10.66	(%)	80 - 70 -	😑 Defa	ult 🔗 70	•	Default
	(144) Reinforced Concrete Arch	100	100	ent (50		1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
	Risk	53.81	57.58	Pero	40		2 40 1 al 30		
	Accident	53.81	57.58		20 - 10 -		10 -		
	Mobility	34.2	34.2		0 10 20 30	40 50 60 70 80 9	0 100 0 10	20 30 40 50 60 70 4	,
	Percent of truck detoured.	34.2	34.2						



Cross Browser Compatibility

- Continuing to update BrM with latest support for all major browsers
 - IE 9, 10, 11+
 - Chrome
 - Firefox
 - Safari
- Allow for newer technologies to continue to be integrated in the future (e.g. HTML5)



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Metric Assessment Report

- Working with FHWA to include logic used for NBIS Metric Assessment Reports
- Ability to use current data to check NBIS Metric compliance



AASHTOWare Bridge Management

Bridge Management 5.2.3

- Planned Release in 2016
- Fully supporting the FHWA Identified Rule Making
- Key Features
 - Capability to perform life cycle cost analysis
 - Capability to perform network level analysis
 - Dashboards for easy data visualization and tracking performance measures.
 - Enhanced User Help System



AASHTOWare Bridge Management

Life-Cycle Cost Analysis



Short-Term LCCA

All costs incurred on a bridge within the program horizon and runs in the context of a set of work candidates specified by users, generated by BrM, or a combination of the two. The short-term LCCA sums the *direct* and *indirect* costs of all actions planned within the program. To accurately evaluate future actions, LCCA will utilize the newly developed deterioration modeling framework.

Long-Term LCCA

Estimates the total life-cycle cost of a bridge incurred once the program is completed. Longterm LCCA allows for reasonable comparisons of bridges in differing condition states. The long-term LCCA disregards indirect costs of actions. BrM forecasts the approximate sequence of interventions that will be performed on the bridge over an extended, user defined period of time (ex. 200+ years).



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Life-Cycle Cost Analysis (LCCA) Requirements Specification

The Life-Cycle Cost Analysis (LCCA) assists agencies in developing bridge maintenance programs. Agencies can evaluate the economic impact of several program alternatives through the LCCA. The length of programs depends on the agencies' policies. However, we'll assume that a typical program extends for a period of 10-20 years.



Introduction

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Version 5.2.2 of the AASHTOWare Bridge Management (BrM) software will introduce the Weibull model as an enhancement to the pre-existing Markovian deterioration model. The introduction of the Weibull model aids in managing the known shortcomings of the Markovian model. The combination of the models provides a more realistic representation of the overall bridge deterioration process

The accuracy of the model is largely dependent on properly configuring the modeling parameters. This document outlines:

- · The effect that the parameter configurations have on the deterioration forecasted by the combined model
- · How an agency can tune the parameters to best meet their needs

Weibull Shaping Parameter (β)

identical to the Markovian model

In BrM 5.2.2 the Weibull model is only used to model the onset of deterioration, or the transition of an element from the best condition state (CS1) to the next condition state (CS2). The rest of the transitions are modeled via the Markovian model. There are several parameters that need to be configured as part of the element deterioration model.

Weibull and Markovian Models

Transition times (T1, T2, T3)

A transition time T_i is defined as the median number of years a unit of the element stays in condition state *i* prior to transitioning to the next state.

Based on this definition, one can expect half of an element originally in condition state *i* to transition to the next state by the specified transition time.

Transition times are defined for both the Weibull and Markovian models

AASH D

As its name implies, the shaping parameter is responsible for controlling the shape of the Weibull distribution. Figure 1 illustrates the effect of different shaping parameters on the Weibull model. A Weibull model with a shaping parameter value of "1" behaves

The point in which all of the CS1 curves in Figure 1 intersect corresponds to the median number of years forthe element to transition to CS2. Fifty percent of the





White Papers

AASHTOWARE BRIDGE MANAGEMEN

White papers providing additional details regarding the Life-Cycle Cost Analysis and Deterioration Modeling enhancements can be found at www.aashtowarebridge.com

AASHTOWare Bridge Management

Enhanced User Help System







AASHC

Bentley

Complete rewrite of the User Manual using Ma	dCap
Flare software	

- Multi-channel publishing for the web-based Help system and, printed documentation
- Clicking the 'Help' icon within the software will take the user to the specific section of the Help System
- Detailed page-by-page explanation

AASHTOWare Bridge Management

Tunnel Inspection Elements

- NTIS final rule released July 2015
- Spreadsheet is available to comply with inventory data submittal to FHWA by December 11, 2015
- The AASHTOWare BrM Task Force is actively pursuing potential methods of including new asset types (tunnels, culverts, signs, etc.) into the BrM Software.
- This will be a multi-phased approach
 - Phase 1 Defining new asset types and implementation of a framework
 - Phase 2 Fully develop the functionality required to integrate new asset types into the software
 - Further phases will be planned out as needed.



AASHTOWare Bridge Management

Questions?



AASHTOWare Bridge Management