Texas Division of Emergency Management (TDEM) Selection Process

The Hazard Mitigation Grant Program (HMGP) requires the preparation of a Benefit Cost Analysis (BCA) to determine the cost effectiveness of a proposed mitigation project.

The BCA is the method by which the future benefits of a mitigation project are determined and compared to its cost.

Information required to perform BCA

- Detailed Cost Estimate of Proposed Project (E&D Fees, Studies, Surveying, Construction, etc.)
- Annual Maintenance Cost
- Life Expectancy of Project
- Historical Damage Cost
- Expected Damage Cost
- Recurrence Interval for Flooding Events
- Depth of Flood Water in Drainage Area
- Square Footage of Structures in Area
- Building Replacement Value of each Structure

Texas Division of Emergency Management (TDEM) Selection Process

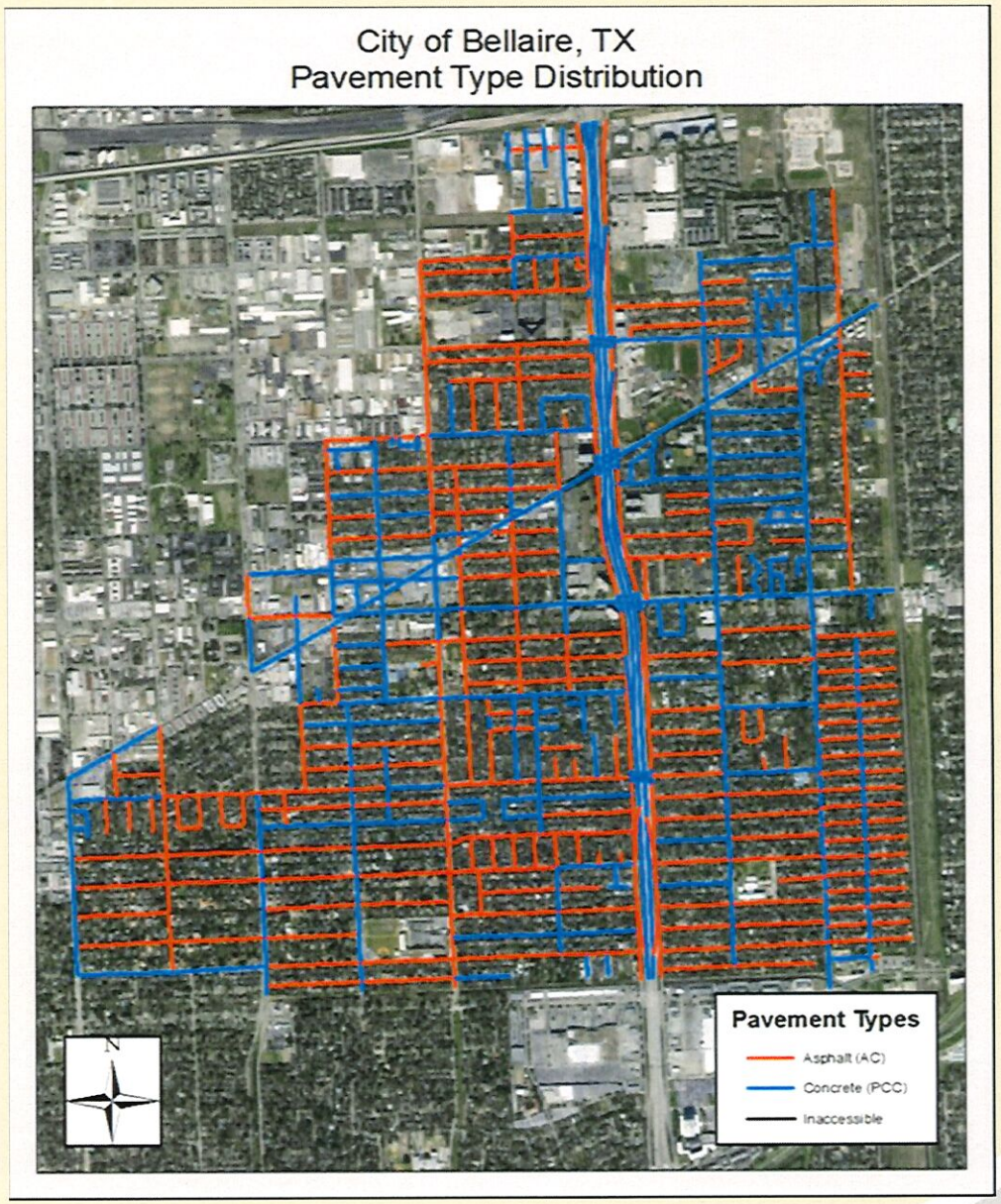
FEMA developed a software with a suite of tools to analyze the cost effectiveness of a project.

All information is then plugged in to the FEMA BCA software to perform a depth-damage assessment by utilizing the flood water depth, structure finished floor elevation, BRV, and structure square footage to determine the benefit.

BCA software then generates a Benefit Cost Ratio (BCR) which is the project's total net annual benefit divided by its total project cost.

Projects considered cost effective are then selected to proceed with design and construction with the highest BCRs being selected first.

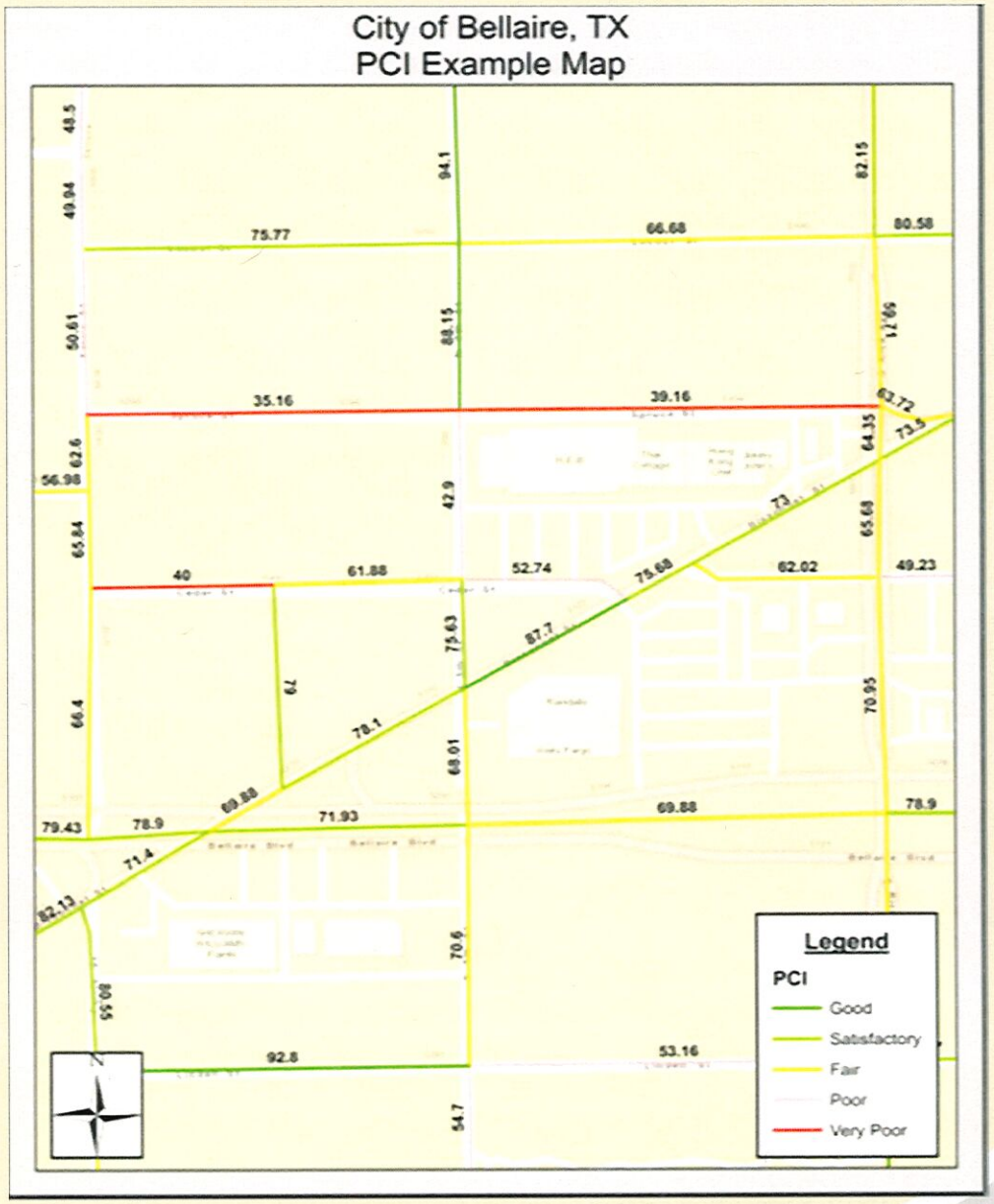
City of Bellaire Selection Process



- **RED** Asphalt Surface
- **Blue** PC Concrete

City of Bellaire Selection Process

Example Map of Spruce Street Area



City of Bellaire Selection Process

City of Bellaire - Public Works Department
Storm Drainage Priority Rating System

Purpose:
To protect the citizens and property of the City of Bellaire by reducing the damage and hazards associated with stormwater run-off.

Calculation:
Each block/segment in the City starts off with a Drainage Ranking Score (DRS) of 0. Points are added as shown below in order to provide a ranking of areas for candidate project locations. This calculation may be redone as new information becomes available.

Item #	Criteria Description			Points
1.)	**Structural Flooding Damage**		25	maximum
a	Structural Flooded Recorded	No Structures Flooded		0
		Pre 1980 Construction		10
		1980-1994		15
		1995-2004		20
		2005-Present		25
2.)	**Existing Drainage Infrastructure**		10	maximum
a	Existing Capacity Versus a 2-Year Standard Design	less than 25%		10
		25% to 50%		8
		50% to 75%		5
		Greater than 75%		0
3.)	**Drainage Study**		10	maximum
a	Excessive Ponding Identified in the Drainage Study	No		0
		Yes		10
4.)	**Drainage Area**		5	maximum
a	Size of Drainage Area Served by Storm Sewer	Less Than 0-10 Acres		0
		10-20 Acres		2
		20-50 Acres		4
		Greater than 50 Acres		5
5.)	**Open Ditch**		5	maximum
a	Is the block served by an open ditch	No		0
		Yes		5
6.)	**Project Readiness**		35	maximum
a	Design Status	No Design Complete		0
		Partial Design Finished		15
		Complete Design		35
7.)	**Regional System**		5	maximum
a	Is there an opportunity for Consideration in a Regional Drainage Project	No		0
		Yes		5
8.)	**Redevelopment Opportunity**		5	maximum
a	Is there an opportunity for future redevelopment on this block	No		0
		Yes		5
			100	MAXIMUM

DETAILED STREET RANKING

Block	Street	Pavement Type	Previous Bond Project	Street Classification	Segment Length	Criteria #1 Structural Flooding					Criteria #2		Criteria #3		Criteria #4		Criteria #5		Criteria #6		Criteria #7		Criteria #8		Maximum Score 100	Maximum Score 100	PCI Rating
						None	Pre-1989	1989-1993	1994-2004	2005-Present	% of Capacity		Excessive Ponding (Drainage Study)		Drainage Area		Ditch or Curb		Project Readiness		Regional Partnership		Redevelopment Opportunity		Drainage Score	Paving Score	
500	2ND	Concrete		LOCAL	251					25	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	25	2	98
500	2ND	Concrete		LOCAL	248					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
1300-1400	3RD	Concrete		LOCAL	945					0	95.36%	0	N	0	3.7	0	N	0	None	0	N	0	N	0	0	26	74
600	7TH	Asphalt		LOCAL	263					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	38	62
700	7TH	Asphalt		LOCAL	264					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	27	73
4400	ACACIA ST	Asphalt	FY2004 Ph3	LOCAL	561					25	116.61%	0	N	0	4.78	0	N	0	None	0	N	0	N	0	25	7	98
7300-7400	ALDER DR	Asphalt		LOCAL	713					0																	
7500	ALDER DR	Asphalt		LOCAL	349					0																	
7600	ALDER DR	Asphalt	RB PHASE 5B	LOCAL	882					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
7700	ALDER DR	Asphalt	RB PHASE 5B	LOCAL	436					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
7800	ALDER DR	Asphalt	RB PHASE 5B	LOCAL	437					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
7900	ALDER DR	Asphalt	RB PHASE 5B	LOCAL	447					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
8000	ALDER DR	Asphalt	RB PHASE 5B	LOCAL	455					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
100	ALLENDALE ST	Asphalt		LOCAL	512					25	51.91%	5	N	0	3.86	0	N	0	None	0	N	0	N	0	30	24	76
1	ALPINE CT	Concrete	FY2006 Ph6 C2	LOCAL	731					25	145.00%	0	N	0	2.36	0	N	0	None	0	N	0	N	0	25	38	62
800	ANDERSON ST	Asphalt	FY2002 Ph2 C1	LOCAL	815				1	20	66.87%	5	N	0	2.94	0	N	0	None	0	N	0	N	0	25	14	86
600	ANDERSON ST	Asphalt		LOCAL	313					0	71.48%	5	N	0	5	0	N	0	None	0	N	0	N	0	5	2	98
900	ANDERSON ST	Asphalt		LOCAL	194					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	24	76
1000	ANDERSON ST	Asphalt		LOCAL	144					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	14	86
1100	ANDERSON ST	Concrete		LOCAL	322					0	88.10%	0	N	0	6.4	0	N	0	None	0	N	0	N	0	0	2	98
1100	ANDERSON ST	Concrete	FY2006 Ph6 C2	LOCAL	186					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
1200	ANDERSON ST	Asphalt	FY2002 Ph2 C1	LOCAL	318					0	84.43%	0	N	0	4.1	0	N	0	None	0	N	0	N	0	0	18	82
1200	ANDERSON ST	Asphalt	FY2002 Ph2 C1	LOCAL	371					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	29	71
1300-1400	ANDERSON ST	Concrete		LOCAL	326					0	49.93%	8	N	0	7.28	0	N	0	None	0	N	0	N	0	8	17	83
1500	ANDERSON ST	Concrete		LOCAL	258					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	22	78
5100-5200	ASPEN ST	Concrete	RB PHASE 4	LOCAL	1319				1	25	100.00%	0	N	0	3.06	0	N	0	None	0	N	0	N	0	25	9	91
5300	ASPEN ST	Concrete	RB PHASE 4	LOCAL	658			1		15	100.00%	0	N	0	8	0	N	0	None	0	N	0	N	0	15	8	92
5500	ASPEN ST	Asphalt	RB PHASE 4	LOCAL	621					0	100.00%	0	N	0	4.63	0	N	0	None	0	N	0	N	0	0	4	96
6800	AVE B	Concrete	BMRP FY2003	LOCAL	491					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
6900	AVE B	Concrete	BMRP FY2003	LOCAL	328					25	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	25	14	86
7000	AVE B	Concrete	BMRP FY2003	LOCAL	156					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	18	82
7000	AVE B	Concrete	BMRP FY2003	LOCAL	182					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7100-7200	AVE B	Concrete	BMRP FY2003	LOCAL	489					25	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	25	11	89
7300	AVE B	Concrete	BMRP FY2003	LOCAL	358			1		25	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	25	10	90
7300	AVE B	Concrete	BMRP FY2003	LOCAL	310					25	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	25	7	93
7400	AVE B	Concrete	BMRP FY2003	LOCAL	321					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7500	AVE B	Concrete	BMRP FY2005	LOCAL	328					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	3	97
7600	AVE B	Concrete	BMRP FY2005	LOCAL	330					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	10	90
7700	AVE B	Concrete	BMRP FY2005	LOCAL	329					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	10	90
7800	AVE B	Concrete	BMRP FY2005	LOCAL	331					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	5	95
7900	AVE B	Concrete	BMRP FY2005	LOCAL	331					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
8000	AVE B	Concrete	BMRP FY2005	LOCAL	331					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	4	96
8100	AVE B	Concrete	BMRP FY2005	LOCAL	330					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
8200	AVE B	Concrete	BMRP FY2005	LOCAL	328					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	4	96
8300	AVE B	Concrete	BMRP FY2005	LOCAL	287					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	12	88
1	AZALEA TRAIL LN	Concrete		LOCAL	513			1	1	25	83.13%	0	N	0	4.27	0	N	0	None	0	N	0	N	0	25	19	81
6900	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	274					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
7000	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	253					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7000	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	254					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7000	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	258					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	14	86
7100	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	256					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7100	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	251					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
7100	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	257					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	4	96
7100	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	254					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
7200	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	254					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
7300	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	256					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7400	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	257					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7500	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	250					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	8	92
7600	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	259					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
7700	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	256					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
7800	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	253					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	0	100
7900	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	260					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	6	94
8000	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	253					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	0	100
8100	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	254					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
8200	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	256					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
8300	BALDWIN AVE	Concrete	RB BALDWIN	LOCAL	232					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	2	98
4400	BASSWOOD LN	Concrete		LOCAL	270					0	115.48%	0	N	0	3.03	0	N	0	None	0	N	0	N	0	0	23	77
4500	BEECH ST	Concrete	RB PHASE 1	LOCAL	1345		1	1	3	25	100.00%	0	N	0	9.81	0	N	0	None	0	N	0	N	0	25	19	81
4600	BEECH ST	Concrete	RB PHASE 5A	LOCAL	908					0	182.76%	0	N	0	2.99	0	N	0	None	0	N	0	N	0	0	7	93
4600	BEECH ST	Concrete	RB PHASE 5A	LOCAL	331					0	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	0	10	90
4600	BEECH ST	Concrete	RB PHASE 5A	LOCAL	175		6			25	100.00%	0	N	0		0	N	0	None	0	N	0	N	0	25	6	94

Bonds for a Better Bellaire 2016

Bonds For a Better Bellaire
Street Ranking List

Rank	Street		Bond Phase	Drainage Score	Paving Score	Cumulative Score *This is a weighted score of (drainage x .60)+(paving x .40)*
1	4700	WILLOW ST	Group B Phase I - 2017	68	23	50
2	4900-5000	MAYFAIR ST	Group B Phase I - 2017	43	55	48
3	500	BOLIVAR ST	Group C Phase II -2018	33	69	47
4	4700	LINDEN ST	Group B Phase I - 2017	45	23	36
5	4900-5000	IMPERIAL ST	Group B Phase I - 2017	43	24	35
6	4500	MAPLE ST	Group C Phase II -2018	42	22	34
7	4600	CEDAR ST	Group C Phase III - 2019	25	45	33
8	5100	SPRUCE ST	Group C Phase II -2018	12	61	32
9	4300	CYNTHIA ST	Group C Phase III - 2019	34	24	30
10	4500	LARCH LN	Group C Phase III - 2019	30	30	30
11	4300	EDITH ST		7	63	29
12	6700	N 5TH	Group C Phase II -2018	8	57	28
13	500	CHELSEA ST	Group C Phase III - 2019	0	64	26
14	4500	MIMOSA DR	Group C Phase III - 2019	30	20	26
15	5200	SPRUCE ST	Group C Phase II -2018	0	65	26
16	4300	BETTY ST		34	11	25
17	4400	EDITH ST		20	32	25
18	4500	HOLLY ST		25	25	25
19	4900-5000	MAPLE ST		25	24	25
20	4300	VALERIE ST		25	24	25
21	5200	CEDAR ST		0	60	24
22	5300	DASHWOOD DR		12	43	24
23	4300	DOROTHY ST		30	15	24
24	4400	LAFAYETTE ST		25	22	24
25	4700	LEHIGH ST		5	53	24
26	4900	VALERIE ST		20	31	24
27	1	AZALEA TRAIL LN		25	19	23
28	4500	BEECH ST		25	19	23
29	4800	FERN ST		15	34	23
30	6300	FERRIS DR		0	57	23
31	4800	GLENMONT DR		25	20	23
32	4700-4800	HOLLY ST		15	36	23
33	7300	S RICE AVE		30	12	23
34	4400	WENDELL ST		25	20	23
35	4500	BIRCH ST		25	17	22
36	4700	CEDAR ST		17	30	22
37	5000	CHESTNUT ST		25	18	22
38	4300	EFFIE ST		30	11	22
39	5100	ELM ST		5	47	22
40	6400	FERRIS DR		0	55	22
41	6400	FERRIS DR		0	55	22
42	4300	HOLT ST		25	17	22
43	4700-4800	HOLT ST		30	10	22
44	4700	LEHIGH ST		15	32	22
45	5100	LINDEN ST		5	47	22
46	4500	LOCUST ST		0	54	22
47	5100	LOCUST ST		15	33	22
48	4700	MAPLE ST		13	36	22
49	100	MARRAKECH CT		30	11	22
50	400	N 3RD ST		0	56	22
51	5100	PATRICK HENRY ST		25	17	22
52	500	S 3RD ST		28	13	22
53	800	ANDERSON ST		25	14	21
54	4400	DARSEY ST		25	16	21
55	5400	DASHWOOD DR		0	52	21
56	6600	FERRIS DR		0	52	21
57	4300	LAMPTON CIR		25	14	21
58	7000	N 5TH		0	52	21
59	4500	PINE ST		15	29	21

City of Bellaire - Public Works Department
Storm Drainage Priority Rating System

Purpose:

To protect the citizens and property of the City of Bellaire by reducing the damage and hazards associated with stormwater run-off.

Calculation:

Each block/segment in the City starts off with a Drainage Ranking Score (DRS) of 0. Points are added as shown below in order to provide a ranking of areas for candidate project locations. This calculation may be redone as new information becomes available.

Item #	Criteria Description		Points	
1.)	**Structural Flooding Damage**		~~25~~ 40	**maximum**
a	Structural Flooded Recorded	No Structures Flooded		0
		Pre 1980 Construction		~~10~~ TBD
		1980-1994		~~15~~ TBD
		1995-2004		~~20~~ TBD
		2005-Present		~~25~~40
2.)	**Existing Drainage Infrastructure**		**10**	**maximum**
a	Existing Capacity Versus a 2-Year Standard Design	less than 25%		10
		25% to 50%		8
		50% to 75%		5
		Greater than 75%		0
3.)	**Drainage Study**		**10**	**maximum**
a	Excessive Ponding Identified in the Drainage Study	No		0
		Yes		10
4.)	**Drainage Area**		**5**	**maximum**
a	Size of Drainage Area Served by Storm Sewer	Less Than 0-10 Acres		0
		10-20 Acres		2
		20-50 Acres		4
		Greater than 50 Acres		5
5.)	**Open Ditch**		**5**	**maximum**
a	Is the block served by an open ditch	No		0
		Yes		5
6.)	~~**Project Readiness**~~ **REMOVED FROM CRITERIA**		~~**35**~~	**maximum**
~~a~~	~~Design Status~~	~~No Design Complete~~		~~0~~
		~~Partial Design Finished~~		~~15~~
		~~Complete Design~~		~~35~~
~~**7.)**~~ **6.)**	**Regional System**		**5**	**maximum**
a	Is there an opportunity for Consideration in a Regional Drainage Project	No		0
		Yes		5
~~**8.)**~~ **7.)**	**Redevelopment Opportunity**		**5**	**maximum**
a	Is there an opportunity for future redevelopment on this block	No		0
		Yes		5
***8.)**	**City of Bellaire Benefit Cost Formula** *(TDEM LIKE)*		**20**	**maximum**
a	Benefit Cost Calculation	Score of 0		0
		Score 1-6		1-19 TBD
		7 or Above		20
			100	**MAXIMUM**

City of Bellaire

DRAINAGE AND FLOOD MITIGATION

Keep Water out of Homes / Living Spaces for 100 Year Event

	Regulatory	Local	Regional
1. Enforce Flood Plain Regulation	✓		
2. Improve Brays			✓
3. Improve N/S Drainage			✓
4. Improve N/S including 610			✓
5. Improve Detention – 100 Year Storm Sewer		✓	

Maintaining Mobilty by Lowering Water Suface Elevation in Streets During Flood Events

		✓	
2. Improve Brays			✓
3. Improve N/S Drainage			✓
4. Improve Cypress Ditch including 610			✓
5. Improve Detention – 100 Year Storm Sewer		✓	
6. Flap Gates			
8. Storm Sewer Maintenance		✓	

Prevent Nuisance Ponding (birdbaths)

	Regulatory	Local	Regional
6. Street Maintenance / Curb Repair		✓	
8. Storm Sewer Maintenance		✓	

Alternative Projects

9. City of Houston Coordination Efforts			✓
10. City Owned Detention Sites		✓	

Nuisance Ponding: puddles commonly found along the curb line that result from pavement deterioration, excessive sprinkler system usage, rain gutter drains, etc.

Impassable Roadway: When vehicles are not able to pass because of storm water elevations

Flooding- When storm waters exceed the limits of City ROW as designed and flow onto private property or into homes.

Key: Objectives Programs

ACTION/MATRIX ORGANIZATION

Preventative Activities

1. Activity – Matrix Line Item 31 (Storms > 100 yr) IN PROGRESS
   Establish a desired level of protection versus the cost to implement (cost benefit analysis).

2. Activity – Matrix Line Item 21 (Infrastructure (COB & Others)
   Establish a comprehensive asset management plan allowing for better short and long-term planning of maintenance and capital improvement costs and needs.

3. Activity – Matrix Line Item 4 (Public Communication))
   Develop an educational program/campaign warning resident of dangers of blocked storm sewers, and how they can help mitigate this problem.

4. Activity – Matrix Line Item 19 (Infrastructure (COB & Others)) IN PROGRESS
   Develop plan to inform residents of the importance of not filling in the floodplain.

Floodplain Management Regulatory Activities (Current and Future)

1. Activity – Matrix Line Item 28 (Economic Impact)
   Update City Ordinances to clearly define development guidelines for structures in the designated flood areas, as defined by current Special Hazard Flood Area Maps. Review and update City Codes based on the recommended changes to the Special Flood Hazard Area Maps.

2. Activity – Matrix Line Item 27 (Economic Impact)
   At all stages of infrastructure project development in the floodplain, gather community input strategies to be examined; allowing the public to see the results, costs, and benefits for alternatives studied. IN PROGRESS

3. ~~Activity – Matrix Line Item 29 (Economic Impact)~~
   ~~Research and evaluate regional approach to the 50% rule, for the development of City of Bellaire guidelines.~~

4. Activity – Matrix Line Item 27 (Economic Impact)
   Ensure adequate City resources are in place to assist residents when applying for buy-out and elevation grants. IN PROGRESS

5. Activity – Matrix Line Item 27 (Economic Impact)
   Develop Bellaire specific commercial drainage requirements.

6. Activity – Matrix Line Item 27 (Economic Impact)
   Evaluate a buy-out program for properties that have flooded repeatedly.

Property Protection Activities

1. Activity – Matrix Line Item 27 (Economic Impact)
   Evaluate updates to the Building Code which would allow residents to take proactive mitigation efforts on their property.

Emergency Service Activities

1. ~~Activity – Matrix Line Item 10 (Mobility)~~
   ~~Properly budget for rescue oriented persons to make logical purchases for rescue equipment. Develop a program to identify, train, and utilize Citizen Rescuers and create MOU (cover liability of the asses use donation). Evaluate reinstating Citizen Emergency Response Team (CERT).~~

2. Activity – Matrix Line Item 11 (Mobility)
   Research, develop scope and policies and procedures, and place into effect a mass notification system. IN PROGRESS

3. Activity – Matrix Line Item 8 (Mobility)
   Formalize a mechanism within the scope of EOC operations whereby a team would be responsible for field reconnaissance as well as publication of information for use by the public via the website, social media, local news media, etc.

4. Activity – Matrix Line Item 12 (Mobility)
   Develop a rescue plan which utilizes field-confirmed data to generate on-the-fly response maps for rescuer pathways.

5. Activity – Matrix Line Item 9 (Mobility)
   Develop a plan to identify, utilize, and position non-conventional access vehicles for use when weather events dictate.

Structural Projects

1. Activity – Matrix Line Item 20 (Infrastructure (COB & Others))
   Coordinate with Harris County Flood Control District (HCFCD) and the U.S. Army Corps of Engineers to determine how additional widening of Brays Bayou will reduce flooding for the City of Bellaire. IN PROGRESS

2. Activity – Matrix Line Items 14 & 16 (Infrastructure (COB & Others))
   Evaluate increasing the size of existing storm water drainage culverts in Bellaire while continuing to utilize drainage impact when selecting roads to be reconstructed. Lower street level when streets are under construction. Strategically locate undergoing storage pipes within the existing street right-of-way to store 100-year localized rainfall events. IN PROGRESS

3. Activity – Matrix Line Item 17 (Infrastructure (COB & Others)) IN PROGRESS
   Determine partners, study alternatives, and develop cost estimates for improvements to increase capacity of the north/south drainage systems and Cypress Ditch.

4. Activity – Matrix Line Item 13 (Infrastructure (COB & Others)) IN PROGRESS
   Include design and installation of backflow prevention systems in the upcoming Bonds for Better Bellaire 2016 Projects. Coordinate with neighboring agencies (i.e. TxDOT, City of Houston, and HCFCD) to prevent backflow storm water from entering the City's underground drainage systems.

5. Activity – Matrix Line Item 32 (Representation)
   Identify any and all regional partnership opportunities (elected & appointed). Determine appropriate representatives from the City for regional agencies.

6. Activity - Matrix Line Item 19 (Infrastructure (COB & Others))
   Identify barriers restricting sheet flow and determine what project could relieve this problem. IN PROGRESS

7. Activity – Matrix Line Item 18 (Infrastructure (COB & Others))
   Create a proactive approach to repair and maintain drainage systems in desirable development areas and neighborhoods with storm drainage systems. Develop a schedule to perform routine maintenance, inspections, and repairs to storm water infrastructure. Expedite a plan to repair and replace the highly critical local drainage systems in the current Cond for Better Bellaire 2016. Re-evaluate the priorities annually and aggressively pursue future bond programs. IN PROGRESS

8. Activity – Matrix Line Item 20 (Infrastructure (COB & Others))
   Coordinate with HCFCD to determine steps necessary to increase the size of the outfall of Kilmarnock Ditch. Construct extreme event outfalls at Bellaire Blvd and within the Southdale Subdivision to Kilmarnock Ditch. IN PROGRESS

9. Activity – Matrix Line Item 22 (Infrastructure (COB & Others))
   Contact surrounding municipalities and the agencies that own the storm sewers to consider upgrading their storm sewer and providing more detention. Investigate City of Houston developments north of Bellaire for total runoff. IN PROGRESS

10. Activity – Matrix Line Items 15 & 16 (Infrastructure (COB & Others))
    Evaluate the conversion of Bellaire's Wastewater Treatment Plant and the dog park and soccer fields along Edith into detentions areas. Evaluate the conversion of the trash transfer station at Beltway 8 to a reservoir for Brays Bayou.

11. Activity – Matrix Line Item 15 (Infrastructure (COB & Others)) REMOVED
    Evaluate the feasibility of adding flood stage gauges at strategic locations in the City to

provide flood water readings for public safety.

12. Activity – Matrix Line Item 24 (Facilities and Equipment)
    Evaluate the transfer of Wastewater Treatment for the City of Bellaire to the City of Houston Facility, including hazard mitigation funding opportunities.

Public Information Activities

1. ~~Activity – Matrix Line Item 1 (Public Communication)~~
   ~~Develop a marketing plan which identifies the City outlets and how to increase participation in them. The plan should list events, stakeholders, etc. Develop and update a list of frequently utilized non-City outlets which the City should use to distribute its messages. This list should include media contacts, etc.~~

2. ~~Activity – Matrix Line Item 23 (Preparedness)~~
   ~~Utilize Town Hall meetings to discuss all-hazard preparedness. Create a preparedness milestone for families.~~

3. Activity – Matrix Line Item 2 (Public Communication)
   Pre-populate communication outlets which needed information, allowing contacts to "opt-out", instead of having to "opt-in". Develop a communication matrix to outline what messages should be sent through which outlets. Evaluate the implementation of a "local street warden" program to deliver City produced storm related communication to their assigned area.

4. Activity – Matrix Line Item 3 (Public Communication)
   Develop public messages to be used prior to and during an event to outline when residents should use 911. The public messages should also include other communication outlets residents can utilized in non-emergency situations.

5. Activity – Matrix Line Items 18 & 31 (Infrastructure (COB & Others) & Storm > 100yr)
   Develop an education program/campaign to inform residents on the level of protection provided by the City's infrastructure. Educate the public that street flooding is preferable to structural flooding.

6. Activity – Matrix Line Item 4 (Public Communication)
   Develop an educational program/campaign to inform residents and stakeholders of regularly utilized communication outlets.

7. Activity – Matrix Line Item 5, 6 & 7 (Public Communication)
   Develop a communication template to be utilized prior to, during and after a flooding even which includes updates on information the City has deemed important based on lessons learned from previous events.

8. Activity – Matrix Line Item 25 (Health & Safety)
   Periodically distribute messages to residents warning of dangers of walking or playing in floodwaters. Everyone should refrain from walking or riding bicycles in floodwaters. Develop a plan with local schools to educate children to avoid walking, playing, or riding bicycles in floodwaters.

9. Activity – Matrix Line Item 2 (Public Communication)
   Evaluate the implementation of a “local street warden” program to deliver City produced storm related communication to their assigned area.