

notes on genjaro sheet/entry

11D - 2009

## Turnout Measurement Options

	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
Existing Conditions	Logger only	Monitoring + bluetooth	Monitoring + SCADA	Monitoring, SCADA, New Gate	Monitoring, New Box and Gate	Full automation
<b>Features</b>						
Existing manual sluice gate	x	X	X	X		
Flow data logger		X	X	X	X	X
Memory card		X	X	X	X	X
Solar power			X	X	X	X
Totalizer			X	X	X	X
On-site display			X	X	X	X
Bluetooth communications		X		X	X	
SCADA			X	X	X	X
New sluice gate				X	X	
New concrete box					X	X
Fully automated gate						X
<b>Costs</b>						
Gate hardware				\$3,900	\$3,900	\$6,000
Instrumentation	\$5,300	\$7,500	\$9,500	\$9,500	\$9,500	\$11,500
Concrete box and materials					\$5,000	\$5,000
Design and Engineering	\$100	\$200	\$300	\$1,000	\$2,000	\$5,000
Installation	\$1,900	\$2,300	\$2,700	\$7,000	\$9,000	\$15,000
Total per gate cost	\$7,300	\$10,000	\$12,500	\$21,400	\$29,400	\$42,500
Total Cost for 5500 gates	\$40,150,000	\$55,000,000	\$68,750,000	\$117,700,000	\$161,700,000	\$233,750,000
Annual Cost for 5500 gates	\$5,618,635	\$7,696,761	\$9,620,951	\$13,712,277	\$15,753,490	\$23,836,467
<b>Average Delivery Performance</b>						
Measurement error	15%	6%	6%	6%	4%	4%
Variability during delivery	9%	8%	8%	6%	5%	2%
Variability among deliveries	10%	4%	4%	4%	2%	2%
Delivery Flexibility	3-hr notice	3-hr notice	3-hr notice	3-hr notice	3-hr notice	3-hr notice

Note: Average measurement error demonstrates average error of any delivery. Averaged over time at any gate The error will be 1/2 or less for existing conditions. Averaged over time for the district the error is near zero.

over how much time?