

Management and Delivery of Major Traffic Signal Retiming Projects

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Objective

- A “Case Study” of Project Delivery
 - Formation of Technical Team
 - Scheduling
 - Making All The Pieces Fit
- City of San Antonio Efforts

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City's Perspective

- 5-Year, \$33 Million Program
- Limited Staff
- Maximize Use of Consultants
 - On-Call
 - MPO Funded
- Formalized "Process" for Traffic Signal Retiming
 - Schedule
 - Coordination with Other Program **Activities**
 - Specific Deliverables
 - Coordinated, Consistent and Timely Submission of Results
 - Optimize Review of Results and Data Archives



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City's Perspective - Processes

- Program Management
- Procurement
- Engineering Design
- Field Installation
 - Communications
 - Control Equipment
 - Signal Timings
- Testing
- Documentation

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City's Perspective – Use of Consultants

- Knowledgeable
- Experienced
- Depth of Personnel
- Accepts Responsibility

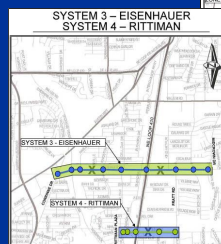
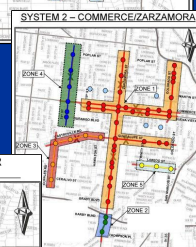
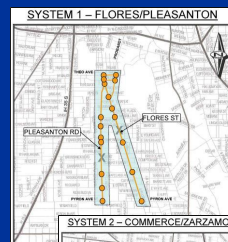


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My Perspective

- Traffic Signal Retiming Study IV
- 87 Intersections – Four Systems
- Schedule
- Personnel Requirements
- Coordination of Study Components
- Deliverables



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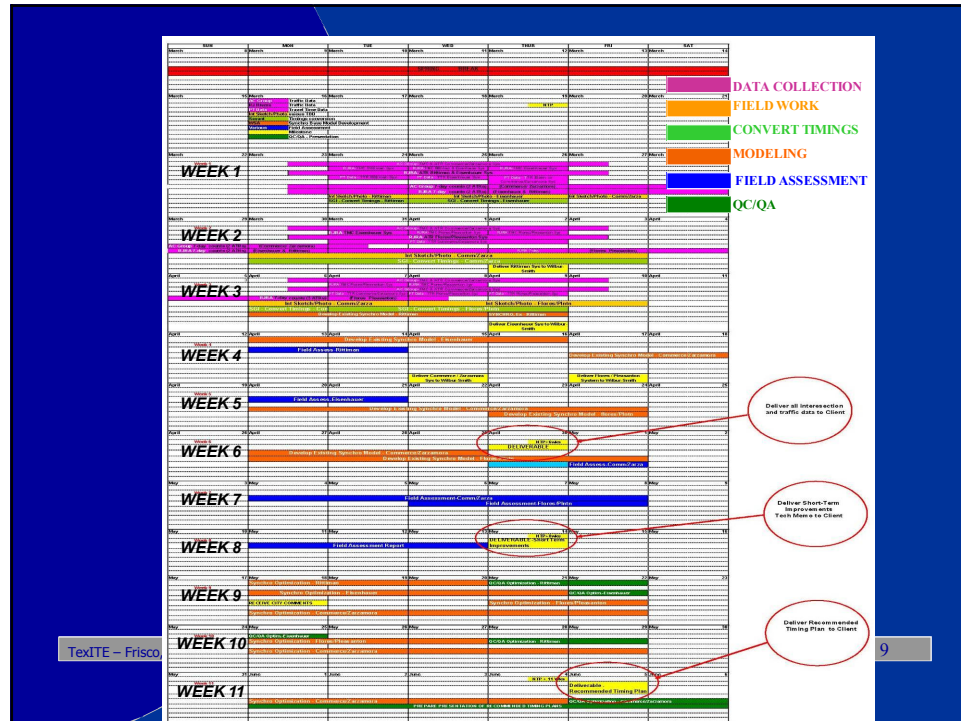
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7

- Aggressive
- Data Collection
 - Collection in 3-weeks
 - Delivery of All Compiled Data in 6-weeks
- Field Work and Modeling – 11 Weeks
- Recommendations for Implementation – Week 11 After NTP

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DATA COLLECTION

- Approach Volume – 24-Hr (28 Loc, 111 Appr)
- Arterial Counts – 24-Hr, 7-Day (12 Links)
- TMC – 3, 2-Hr Peak Periods (69 Loc, 111 Counts)
- Intersection Photo – 2 per Appr (88 Loc, 329 Appr)
- Intersection Sketch – 90 Loc
- Video Logging – 12 Links, 3 Peaks (481 .mov files)
- GPS Travel Time – 12-Links, 3-Peaks, 20-Dir, 5-Runs per Dir (84 Compiled Files)

1,911 Data Files (.xls, .csv, .rdf, .pdf, .jpg)

481 Video Files

21.3 gigabytes

DATA MANAGEMENT

- File Naming Conventions
 - 1_AM_COM_ZAR_TMC_P.xls
- ftp Site for Sharing
- QC/QA

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PURPOSES OF DATA

- Input to Synchro models
- Field Assessments
- Archival

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OTHER PRIMARY TASKS.....

- Conversion of Existing Signal Timings for Synchro Input (Base Models)
- Basic Interval Timings
- Field Assessment
- Short-Term Improvements
- Cycle Length Assessment

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.... OTHER PRIMARY TASKS

- Synchro Calibration
- Optimization
- On-Screen Review of Optimization
- Preliminary MOE
- Plan Schedule
- Development of Electronic Timing Files
 - 2070 NextPhase
- Phase Layout Sketches

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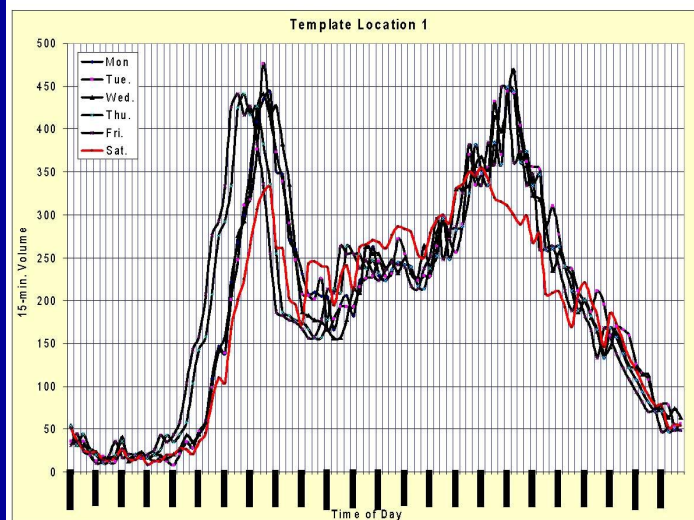
TEMPLATES !!!!

- Maximum Use of Data Templates
 - All Count Data
 - Timing Conversion
 - Basic Interval Timings
 - MOE
 - Weekly Status Reports
 - Phase Layout Sketches
 - Etc.

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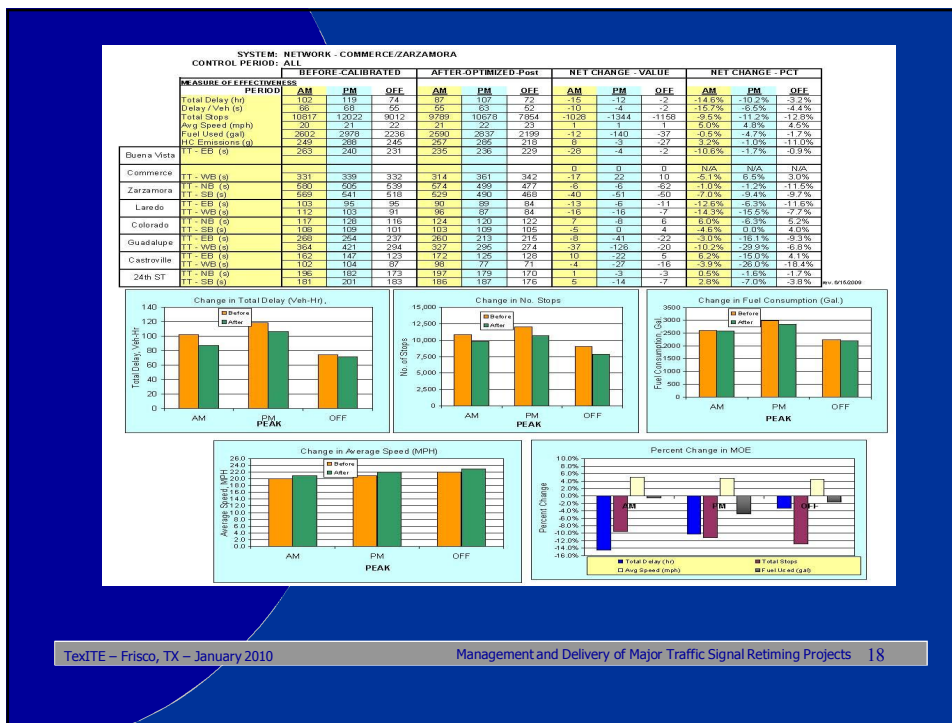
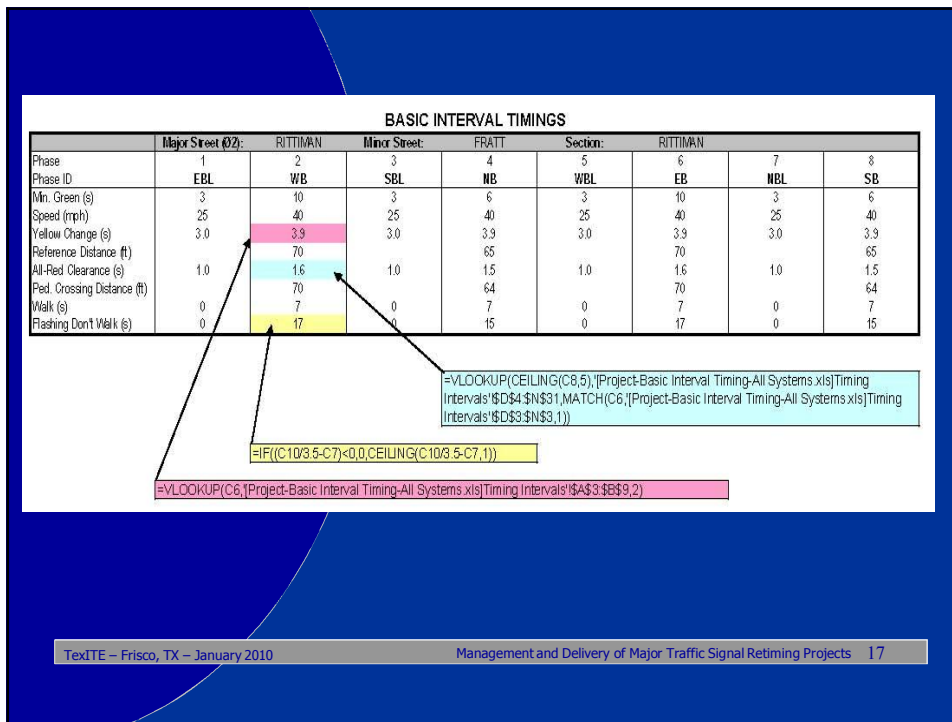
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EXAMPLE – 7-DAY, BI-DIRECTIONAL COUNTS GRAPH
(TIME-OF-DAY PLAN EVALUATION)



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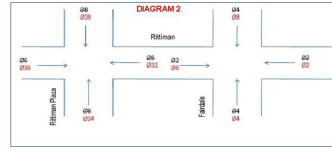
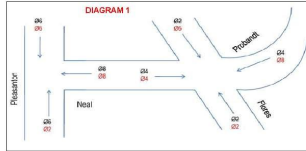
DELIVERABLES

• Short-Term Improvements Recommendations

MAY 22, 2009, Prepared by JLF

Recommendation Approved for Optimization Runs

Signal ID	Intersection	Recommendation	Signal Road	Placing	Detection	Signaling	Markings	ADA	Other	Implementation Status (CoSA)
1-Fire/Pasadena	Pasadena	Replaced for modernization - 1 Controller		X						See Diagram 1
2-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						See Diagram 1
3-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						Existing 200 cabinet to be replaced with 200
4-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						Existing 200 cabinet to be replaced with 200
5-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						Existing 200 cabinet to be replaced with 200
6-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						Existing 200 cabinet to be replaced with 200
7-Elmhurst	Elmhurst Rd	Replaced and sign EB as a through and a right turn only lane				X	X			See Diagram 2
8-Ritman	Ritman	Replaced for modernization - 1 Controller		X						See Diagram 2



Recommendation Specifically NOT Approved

1-Fire/Pasadena	Pasadena	Replaced for modernization - 1 Controller		X		X	X	X	X	
2-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						See 200 Cabinet control support 8 phases
3-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						See 200 Cabinet control support 8 phases
4-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						See 200 Cabinet control support 8 phases
5-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						See 200 Cabinet control support 8 phases
6-Commerce/Zaramora	Commerce	Replaced to 2, 4, 6, 8 (existing phases 2 & 4)		X						See 200 Cabinet control support 8 phases
7-Elmhurst	Elmhurst Rd	Replaced and sign EB as a through and a right turn only lane		X		X	X	X		
8-Ritman	Ritman	Replaced for modernization - 1 Controller		X						See 200 Cabinet control support 8 phases

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DELIVERABLES

• Cycle Length Assessment

Corridor	From	To	AM	Recommended CL	PM
Zaramora Street	Brady Boulevard	Poplar Street			
Commerce Street	Colorado Street	19th Street	65 seconds	70 seconds	75 seconds
Buena Vista Street	19th Street	Colorado Street			
Zaramora	Thompson Place	Darby Boulevard	150 seconds/75 seconds half cycle	150 seconds/75 seconds half cycle	150 seconds/75 seconds half cycle
26th Street/Copples Road	Ceralvo Street	Castroville Road	80 seconds/40 seconds half cycle	84 seconds/42 seconds half cycle	84 seconds/42 seconds half cycle
Castroville Road	26th Street	Hamilton Avenue			
24th Street	Durango Boulevard	Poplar Street	85 seconds	90 seconds	95 seconds
Laredo	Trinity	San Marcos	80	80	96

CYCLE LENGTH ASSESSMENT - EXAMPLE

Critical Intersection LOS (v/c ratio)	Cycle Length (sec)											
	US 99 D (0.85)	C (0.75)	C (0.75)	D (0.75)	US 99 D (0.85)	C (0.75)	C (0.75)	D (0.75)	US 99 D (0.85)	C (0.75)	C (0.75)	D (0.75)
US 99	18.8	10.0	10.0	10.0	18.8	10.0	10.0	10.0	18.8	10.0	10.0	10.0
Fire City	40	41	42	42	39	40	41	43	44	45	46	46
Number of Stages	2215	2204	2218	2218	2389	2364	2330	2346	2333	2322	2313	2313
Fuel Consumption (gph)	67	68	69	69	67	68	69	70	71	71	72	72
Bandwidth Efficiency	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%	3.8%
NB Bandwidth as % Cycle Length	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
SB Bandwidth as % Cycle Length	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%	3.7%
NB Bandwidth as % Green (Max Constructed)	70%	83%	83%	83%	70%	83%	83%	83%	70%	83%	83%	83%
SB Bandwidth as % Green (Max Constructed)	58%	83%	83%	83%	58%	83%	83%	83%	58%	83%	83%	83%
NB Band at Beginning of Green?	Y	N	N	N	Y	N	N	N	Y	N	N	N
SB Band at Beginning of Green?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
DATA												
NB	Band Width	26	19	19	19	26	19	19	19	26	19	19
Green time worst intersection	40	23	23	23	40	23	23	23	40	23	23	23
SB	Band Width	27	19	19	19	27	19	19	19	27	19	19
Green time worst intersection	40	23	23	23	40	23	23	23	40	23	23	23

NOTE: Intersection Bandwidths in Bold are based on half cycle since at least 1 intersection is operating as a half cycle
NOTE: Minimum CL is 145 seconds.

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DELIVERABLES

- Phase Sequence and Splits

PHASE SEQUENCE AND SPLITS - EXAMPLE

Phase Phase ID	Major Street (20)			PLEASANTON			Minor Street			GERALD			Section			1-FLORES/PLEASANTON			Timing Plan			AM Peak			Cycle Length (s)			Standard 8 Phase		
	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	0%	Existing	Proposed
Lag Phase Split (s)	0	0	0	32	43	19	0	0	0	17	27	10	0	0	0	33	43	10	0	0	0	17	27	10	50	70	20	14	60	70
% Cycle	0%	0%	0%	60%	61%	40%	0%	0%	0%	34%	39%	20%	0%	0%	0%	60%	61%	40%	0%	0%	0%	34%	39%	20%	50	70	20	14	60	70

Phase Phase ID	Major Street (20)			FLORES			Minor Street			DIVISION			Section			1-FLORES/PLEASANTON			Timing Plan			AM Peak			Cycle Length (s)			Standard 8 Phase-TEE Int		
	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	0%	Existing	Proposed
Lag Phase Split (s)	0	0	0	32	46	14	0	0	0	18	24	6	0	0	0	32	46	14	0	0	0	18	24	6	50	70	20	14	60	70
% Cycle	0%	0%	0%	64%	66%	2%	0%	0%	0%	36%	34%	-2%	0%	0%	0%	64%	66%	2%	0%	0%	0%	36%	34%	-2%	50	70	20	14	60	70

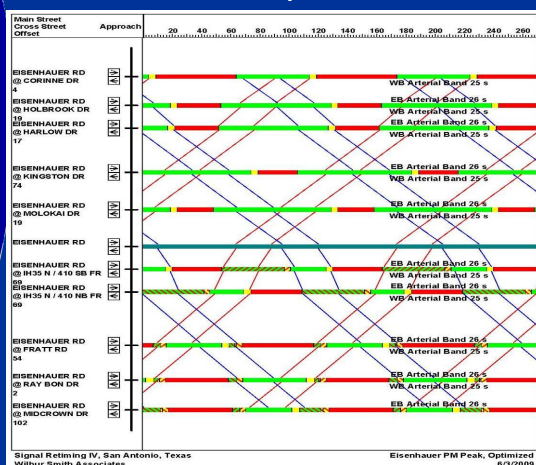
Phase Phase ID	Major Street (20)			PLEASANTON			Minor Street			DIVISION			Section			1-FLORES/PLEASANTON			Timing Plan			AM Peak			Cycle Length (s)			Standard 8 Phase		
	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	East	Prop.	Δ	0%	Existing	Proposed
Lag Phase Split (s)	0	0	0	30	45	15	0	0	0	20	35	5	0	0	0	30	45	15	0	0	0	20	35	5	50	70	20	14	60	70
% Cycle	0%	0%	0%	60%	64%	4%	0%	0%	0%	40%	38%	-4%	0%	0%	0%	60%	64%	4%	0%	0%	0%	40%	38%	-4%	50	70	20	14	60	70

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- Synchro Results – Calibrated and Optimized

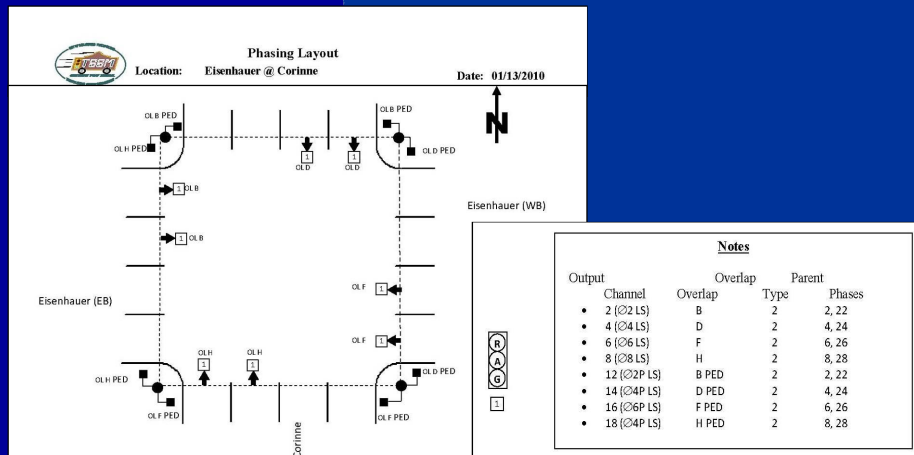


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DELIVERABLES

- Phase Layout Sketches (w/ Electronic Timing Files)



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KEY POINTS

- Entire Process Has Been Developed By City Staff:
 - To Maximize Results (Product and Time)
 - To Minimize Review of Most Important Products
 - To Provide Consistency Across Multiple Projects by Different Consultants
 - To Provide Archival Database for Future Analysis

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KEY POINTS

- Consultant:
 - Schedule and Actively Manage Tasks
 - Assure Quality of Results
 - Assure Depth and Expertise of Technical Personnel
 - Communications with City PM
 -Only That Which is Necessary