20TH Annual ATNI TRIBAL TRANSPORTATION SYMPOSIUM

INTERSECTION CONTROL ALTERNATIVES
“BIG PICTURE” OF INTERSECTION CONTROL ALTERNATIVES

- TRAFFIC MOBILITY AND CIRCULATION
  - COMPREHENSIVE TRANSPORTATION PLANS

- BASIC ALTERNATIVE OPTIONS
  - STOP/YIELD CONTROL
  - PEDESTRIAN CROSSING CONTROL
  - TRAFFIC SIGNAL SYSTEMS
  - ROUNDABOUTS

- TEMPORARY / INTERIM/ ULTIMATE IMPROVEMENTS

- CONSTRUCTION COST ESTIMATING TOOLS
FACTORS INFLUENCING PROJECT COSTS FOR INTERSECTION CONTROL ALTERNATIVES

- STATE, LOCAL OR TRIBAL JURISDICTION
- FUNDING TYPE (FEDERAL /TRIBE)
- FUNDING TIMING
- ENVIRONMENTAL COMPLIANCE
- EXISTING CONDITIONS
  - TOPOGRAPHIC CONSTRAINTS
  - RIGHT-OF-WAY CONSTRAINTS
  - SOILS
  - SPEED LIMIT
  - ROADWAY GRADE
  - UTILITY RELOCATION
INTERSECTION CONTROL ALTERNATIVES FOR TRIBAL PROJECTS
Traffic Signals were preferred at highway points to handle the high level of through traffic and provide separate pedestrian crossing phases. Major freight movement along these routes and the existing pattern of signalized intersections also led to the preference for signals.
Traffic Signals and Roundabouts were both viable future alternatives, intersections within close proximity need to be a consistent design consistently for best operations.
Four-way stop-control worked adequately, but revisions to the intersection for pedestrian safety and the creation of a central transportation hub near busy tribal centers would benefit the community.
Unique roundabout design while preserving room for “Orca” fountain to west.

Constructed on undisturbed ground without need for traffic control.

2004 construction cost $350,000 - Design $35,000
INTERSECTION CONTROL ALTERNATIVES
PROJECT EXAMPLES WITH
TRIBAL APPLICATIONS
BETHEL WYE ROUNDBOUGHT/ SR 166 - PORT ORCHARD, WA

- The first modern roundabout on a Washington State Highway.

- Winner of State’s APWA 1999 “Best City Project”
While roundabouts were the city’s preferred alternative, available right-of-way and impact to septic drainfield precluded alternative at the time.

Interim plan was developed with coordinated signals and additional turn lanes.
Roundabouts option worked best for near and long-term; however City’s desire was to have traditional downtown feel.

Project constructed as Two-Way (with turn restriction) and All-Way Stop
TRIBAL PLANNING FOR SIGNIFICANT DEVELOPMENT ADJACENT TO STATE HIGHWAY INTERCHANGES
Preliminary Plan for the single-lane roundabout (ultimately to be a multi-Lane roundabout) at the US 12-WB Off-ramp have been approved by WSDOT
I-5/TUMWATER BOULEVARD – TUMWATER, WA

- **Ultimate Intersection Improvements**: Multi-lane Roundabouts at ramp intersections.

- **Interim Intersection Improvements**: Ramp and City road widening and reconstructed traffic signal at SB Off-Ramp. Graded to accommodate Ultimate Improvements.
“Split Diamond “
Interchange options
chosen with multi-lane
roundabouts selected for
intersection control west
of US 101, and traffic
signalized intersection
control east of US 101
“RULE OF THUMB” CONSTRUCTION COST ESTIMATING TOOLS FOR INTERSECTION/PEDESTRIAN CONTROL ALTERNATIVES

○ INTERSECTION CONTROL
  ✤ STOP/YIELD Control
    ✓ Standard Sign - $500 each
    ✓ LED sign (SOLAR) - $2,000/sign
    ✓ LED sign (HARD WIRED) - $20K
    ✓ Overhead Flashing Beacon - $50K

○ PEDESTRIAN CONTROL
  ✤ Standard Signing/Markings - $2.5K
  ✤ RRFB Crossing (A) - $60K
    (Pushbutton – Hardwired with advanced LED Signing)
  ✤ RRFB Crossing (B) - $35K
    (Pushbutton – Hardwired without advanced LED Signing)
  ✤ RRFB Crossing Solar (A) - $20K
    (Pushbutton without advanced LED Signing)
  ✤ RRFB Crossing Solar (B) - $30K
    (Bollards without advanced LED Signing)

○ INTERSECTION CHANNELIZATION
  ✤ Two-lane To Three Lanes (FOR LT Lane)
    $300K - $500K
  ✤ Three-lane To Five-lanes
    ($500K - $750K)
  ✤ Hard Improvement Cost Factors
    ✓ Pedestrian Amenities
    ✓ Enclosed/Open Drainage System
    ✓ Street Lighting

○ TRAFFIC SIGNAL SYSTEMS
  ✤ 3- or 4 – Approach Intersection
    $250K To $300K
  ✤ Cost Factors
    ✓ High-traffic volumes (i.e. Traffic Control)
    ✓ Decorative Standards
    ✓ Bells/Whistles (LED luminaire/UPS, etc.)
“RULE OF THUMB” CONSTRUCTION COST ESTIMATING TOOLS FOR INTERSECTION/PEDESTRIAN CONTROL ALTERNATIVES (continued)

- **ROUNDABOUTS**
  - Single Lane
    - ($300K To $600K)
  - Multi-lane
    - ($750K To $1,250K)
  - Cost Factors
    - Project Location (Rural Or Urban)
    - Construction On Undisturbed Ground
    - Construction At Existing Intersection
    - Existing Roadway Grade (4% Max Thru RB)
    - Temporary By-pass Needed?
    - Central Island Features
    - Decorative Concrete/Bells Whistles
    - Traffic control

- **INTERCHANGES**
  - Access Point Change – Requires Interchange Justification Report (IJR)
    - ($250K To $500K)
  - No Access Point Change – Treat As Intersection (STOP, Traffic Signal, or Roundabout Control)

- **PS&E AND CM/CE**
  - For planning purposes, add 35% of construction cost for consideration of environmental compliance, design and construction management/engineering