LD Procedural Guide

- **Identify Restriction**
  - Short term
    - Night time - open by 5AM next day
    - Weekend – open by 5AM Monday
  - Long term
    - Open by xx/yy/2015
    - Open after x weeks or y months
    - Also used to compute daily value for A+B bidding (Design-Build)
  - Full closure
    - Stop traffic
    - No detour
    - Short term
    - i.e. blasting

- **Short Term -** LDs for increments of 15 minute or 1 hour periods
  - Identify detour lengths & respective travel speeds (Use Google Map)
  - Determine Peak (AM) Hourly Volume
  - Determine % truck traffic
  - Enter data into excel spread sheet named Lane Rental
    - Spreadsheet set up to compute LDs for 6 different situations – enter each situation in "Condition 1" , "Condition 2" etc. Copy & paste column if more situations are needed.
    - Enter % Trucks (the Avg. User Wage is computed)
    - # of Lanes Open (Constr) = the fewest lanes available on detour.
      - If detour requires exiting a ramp and using cross streets, the value would be the fewest lanes on detour which includes ramp (this is usually 1).
    - Speed (Constr) and Travel Distance (Constr) from information attained from Google Maps.
      - If only a reduction in lanes, speed = designation in TC plans and distance computed from stations in TC plans.
    - # of Lanes (Complete) is the number of lanes existing or number of lanes open after detour condition is over.
    - Speed (Complete) is usually posted speed.
      - Unlikely, but should the route have signals and/or turning movements use Google Map to compute.
    - Travel Distance (Complete) is the distance from where detour begins to where detour ends.
      - Usually from mainline, just prior to exit ramp, to the mainline, just after entrance ramp. Use Google Map to compute.
    - Consider Other Impacts – enter "yes" if there are other impacts other than the road user.
      - This is rarely used. (If used, there must be considerable impact to businesses, safety (school, emergency vehicles).
      - If yes is selected the LDs are increase by 20%. This value may be altered by editing the formula in the cell.
      - If used make sure you include reasoning in Assumptions.
    - One Directional Traffic – used when one direction of traffic is stopped while the other direction is allowed to proceed through work zone. (i.e. flagger w/ pilot car)
    - After data entered hourly and 15 Minute LDs are computed.
    - Add assumptions at bottom of spreadsheet.
  - Submit summary of results to Requestor with spreadsheet(s).

- **Long Term -** LDs are daily (24 hour period)
  - Identify detour lengths & respective travel speeds (Use Google Map)
  - Determine Average Annual Daily Traffic (AADT)
  - Determine % truck traffic
  - Enter data into excel spread sheet named User Cost Calc
    - Condition - Spreadsheet set up to compute LDs for 6 different situations – enter each situation in "Condition 1", "Condition 2" etc.
      - Copy & paste column if more situations are needed.
      - These are major sequences that affect traffic traveling through the project
    - Enter State Estimated Duration (days) & State $ Estimate.
      - Data needed only if an A + B project or including an incentive for completing project early
      - If not an A + B or no incentive enter 1 in State Estimate Duration and N/A in State $ Estimate
    - Enter % Trucks (the Avg. User Wage is computed)
    - # of Lanes Open (Constr) = the fewest lanes available on detour.
      - If detour requires exiting a ramp and using cross streets, the value would be the fewest lanes on detour which includes ramp (this is usually 1).
    - Duration of TC Condition = estimated duration in contract time for the situation represented.
      - Data needed only if an A + B
      - If not an A + B enter 1
    - Speed (Constr) and Travel Distance (Constr) from information attained from Google Maps.
      - If only a reduction in lanes, speed = designation in TC plans and distance computed from stations in TC plans.
    - # of Lanes (Complete) is the number of lanes existing or number of lanes open after detour condition is over.
    - Speed (Complete) is usually posted speed.
      - Unlikely, but should the route have signals and/or turning movements use Google Map to compute.
    - Travel Distance (Complete) is the distance from where detour begins to where detour ends.
      - Usually from mainline, just prior to exit ramp, to the mainline, just after entrance ramp. Use Google Map to compute.
    - Consider Other Impacts – enter "yes" if there are other impacts other than the road user.
      - This is rarely used. (If used, there must be considerable impact to businesses, safety (school, emergency vehicles).
      - If yes is selected the LDs are increase by 20%. This value may be altered by editing the formula in the cell.
      - If used make sure you include reasoning in Assumptions.
    - One Directional Traffic – used when one direction of traffic is stopped while the other direction is allowed to proceed through work zone. (i.e. flagger w/ pilot car)
    - After data entered LDs (Daily Value Per Condition) are computed.
    - Prorated Daily Value is the sum of the Daily Values Per Condition prorated over the duration of the entire project.
    - Add assumptions at bottom of spreadsheet.
  - A Spread Sheet has been developed should a long detour exist which will capture fuel costs. (User Cost Calc Fuel)
  - Submit summary of results to Requestor with spreadsheet(s).

- **Full Closure** – Used when traffic is stopped for short periods of time (30 minutes) and there is no detour. LDs generally for increments of 5 or 15 minute periods
    - Determine the allowable closure time and LD increment
        - The spread sheet is currently set up for an allowable 30 minute closure and LDs for each 5 minute period after.
    - Determine Average Annual Daily Traffic (AADT)
    - Determine % truck traffic
    - Enter data into excel spread sheet named Full Closure
        - Enter Hourly Volume and % Trucks (the Avg. User Wage is computed)
        - # of Lanes = the number of lanes in both directions that will be opened after work requiring closure is completed.
        - The spreadsheet computes Road User Cost for each 5 minute increment.
        - Add assumptions at bottom of spreadsheet.
    - Submit summary of results to Requestor with spreadsheet.

Additional Spreadsheet Information

- AADT & Hourly Volume – use most recent figures; if too old increase rate by 1 % per year)
- Data Sources:
    - ADOT traffic data - http://www.azdot.gov/planning/DataandAnalysis/average-annual-daily-traffic
    - Transportation Data Management System - http://adot.ms2soft.com/tcds/tsearch.asp?loc=Adot&mod=
    - Local government websites
    - Project Traffic Reports
- Use peak AM volumes for overnight closures and required to be open in the AM
- % T = percent commercial vehicles (trucks) also found on ADOT traffic data website
- Average User Wage – based on CPI (already plugged in formula); update at least every 5 years
- Length (in miles) of lane closure, full closure, or detour. To get accurate length can be time consuming, therefore beginning and end of closure starts when traffic is fully merged into detour configuration. For example, full closure of an EB 3 lane freeway. Impact to traffic would begin when speed is reduced and three lanes begin merging into two lanes. I usually begin full closure detours where traffic is fully transitioned into the number of lanes open on detour (begin at exit ramp gore). Continue until back to 3 lane configuration (end of entrance ramp gore).
- Use google maps to determine length and detour speeds.
- Speed for existing is generally posted speed

Type of Spreadsheets

- Daily Value – use when LDs are for a full day. i.e. A+B projects, roadway needs to be open by a certain date. Uses AADT
- Daily Value – use when detour is over 10 miles
- Lane Rental – use when LDs are for an hour or portion of an hour. i.e. roadway needs to be open by 6AM. Uses hourly volumes
- Lane Rental (mod) – use when there is a full closure and when considering the impact to the existing traffic on the detoured route. Other spreadsheets do not consider impacts to the existing traffic on the detoured route.
- Full Closure – use when roadway is closed and traffic is stopped for a short period of time. i.e. blasting