## SIGNAL SYSTEM SYNCHRO MODEL

### SYNCHRO MODEL CHECKLIST

- [ ] Use ODOT Synchro Template – for preferred ODOT parameters

- [ ] Use the following Table for all Minimum initial times:

<table>
<thead>
<tr>
<th>Movement</th>
<th>Min. Green Time (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Turns</td>
<td>7</td>
</tr>
<tr>
<td>Main Street Thru</td>
<td>20</td>
</tr>
<tr>
<td>Side Street Thru</td>
<td>10</td>
</tr>
</tbody>
</table>

- [ ] Calculate the clearance intervals and the pedestrian times for all intersections

- [ ] If the main street pedestrian volume is greater than 5 people per hour, make the main street split time greater than the total main street pedestrian time
  - [ ] If low volume peds, or TOD plans will not accommodate peds, uncheck

- [ ] Do not use half or double cycles

- [ ] All time of day plans run at least 2 consecutive hours

- [ ] Use ODOT provided speed data for corridor speed

- [ ] Designate a master intersection for signal systems.
  - [ ] Typically the most complicated intersection to improve offset seeking during plan transitions.

- [ ] Adjust system offsets after optimization to create better progression through the signal system.
  - [ ] Synchro’s algorithm goal is to minimize overall system delay – not necessarily arterial progression.

- [ ] Utilize “queue” feature of Synchro time space diagrams to identify potential queuing issues and adjust splits and offsets to mitigate as necessary.

- [ ] Confirm effectiveness of adjustments using Simtraffic.

- [ ] Hit F12 by phase to ensure min splits are correct in the field box

- [ ] Aerial image to scale

- [ ] Proposed base model sent to Office of Traffic Operations

- [ ] Provide completed OTO – Standard Signal Timing Tables
  - [ ] Local Controller Data
  - [ ] Volume Data
  - [ ] Coordination Timing - EXISTING
  - [ ] Coordination Timing - PROPOSED

Designer Signature: _____________________________  Date: ______________
**SYNCHRO TERMS**

**Minimum Initial** – The minimum initial is the first timed portion of the green interval. The duration of the minimum initial is generally based on the number of vehicles that can be in queue between the upstream phase detector and the stop line.

**Minimum Splits** – The shortest amount of time allowed for a phase. It is the sum of the Minimum Initial interval, the yellow time, and all red time.

**Total Split** – The sum of the green, yellow, and all red intervals assigned to a phase.

**Lagging Phase** – Used to reverse the order of odd paired phases and even paired phases. Usually the odd phases are assigned to left turns and even phases are through movements. By allowing phases to lag you would service the left turns after the through movements instead of before.

**Allow Lead/Lag Optimize?** – When Synchro is optimizing offsets, it will look to see if lagging a phase will improve traffic flow. ODOT does not like to use this option because of the possibility of yellow ball traps. It will only be a viable option, if all the signals on the corridor have protected only left turn movements.

**Recall Mode** – Each phase can have a recall mode of None, Minimum, Maximum, Coordinated, or Ped. No Recall means the phase can be skipped. Minimum Recall means the phase will always service the Minimum Initial and will never skip. Maximum Recall means the phase will always service the Maximum Split and never skip. Pedestrian Recall means the phase will always service the walk and ped clearance interval. Coordinated Recall means the referenced coordinated phases can be placed on either Max or Min recall.

**Dual Entry** – An option which allows two phases to run with one another even though only one of the phases received a call from a detector. Usually used to pair opposing through movement together. Example: Phases 4 & 8 or 2 & 6

**Fixed Force Off** – Allows the extra green time from a previous phase to be added to the following phase. When unchecked the extra green time is used on the coordinated phases. ODOT prefers this option to be unchecked for all phases not coordinated—check boxes for Fixed Force Off should be on for the Coordinated phases only. We favor mainline progression and would like the extra green time to be added to the coordinated phases.

**Offset** – The time relationship between coordinated phases defined reference point and a defined master reference

**Reference Phase** – The phases that are to be coordinated through a signal system.

**Referenced to** – The point in a phases split where the offset is referenced to

**Master Intersection** – The reference intersection where the offsets are calculated from. It will have an offset value of zero. Usually the busiest intersection, having a large amount of side street traffic along with mainline traffic.