VISSIM and VISWALK are microscopic simulation tools developed by PTV. VISSIM is a multi-modal traffic flow simulation software package. It models driving behaviors including: car-following, lane-changing and lateral behavior within a lane.

It can be used to analyze the operations of any transportation mode and their combinations including cars, trucks, public buses, shuttle buses, trains, taxis, bikes and pedestrians. VISWALK simulates and models walking behaviors. By combining VISSIM and VISWALK the interactions between the roadway traffic and pedestrians can be modeled realistically.

VISSIM/VISWALK can be applied in complex traffic operational analysis, including highway design, highway interchange design, arterial and intersection design, urban streets design and traffic analysis, downtown with high volume of pedestrians, and traffic congestion managements.

Various project applications with VISSIM/VISWALK are presented in the paper. Model development, model calibration and scenario application are included. Data used as inputs and data used as calibration targets are discussed. Model calibration and the problems associated with model calibration are a specific interest in the application of the program.

APPLICATION 1:
Cumberland Metra Station (City of Des Plaines, IL)
- Transit-oriented redevelopment plan for the Cumberland Metra Station area
- New roundabout design
- VISSIM model was used to evaluate the traffic operational performance of the study area

APPLICATION 2:
Old US 20 and Corwin Corridor Study
(Elkhart County Redevelopment Commission)
- New community development
- Redesign of the intersection of Old US 20 and Corwin St

APPLICATION 3:
Chicago Union Station Master Plan (City of Chicago)
- Input data
  - Cars and trucks – Synchro model
  - CTA buses – CTA boarding and alighting counts, schedules
  - Private shuttle buses counts – at Chicago Union Station and Ogilvie Transportation Center
  - Taxi at Chicago Union Station
  - Pedestrians – Legion model results, Madison access counts, pedestrian crossing counts at intersections
  - Signal timing plans – Synchro model
- Baseline model calibration
  - Driving behaviors
  - Priority rules
  - Pedestrian interactions with buses
  - Reasonable checking
  - Reality checking
  - Travel time (data collected via CTA Bus Tracker)

APPLICATION 4:
Elgin-O’Hare Extension / O’Hare West By-Pass (IDOT)
- VISSIM modeling areas: three sub-areas were modeled with VISSIM (complicated system segments)
- Freeway interchange alternative designs were tested
  1. Elgin-O’Hare Expressway and I-290 interchange
     - Included Elgin-O’Hare Expressway from east of Arlington Heights Rd to west of Meacham Rd, I-290 from Bixlerfield Rd to US 29
     - The challenge includes: closely located on-ramps, weaving and high peak hour volumes from the Hamilton Lake area
     - Some designs failed VISSIM operational test
     - LOS for each segments were calculated from detailed output from VISSIM models since the standard HCM cannot be applied to such complicated area

APPLICATION 5:
Diverging Diamond Interchange at I-90 and Elmhurst (IDOT)
- Located at I-90 and Elmhurst Road
- Alternatives: DDI vs. Parclo B Single
- Both alternative were modeled in VISSIM
- System performance were compared
- Interchange delays were compared

APPLICATION 6:
Roundabout (City of Carmel, IN)
- Located at E 116th Street and Hazel Dell Parkway, Carmel, IN
- A metered 2-lane roundabout
- Westbound approach is signal controlled to provide more gaps for the heavy volume southbound traffic
- The signal is designed to be turned on when southbound queue reaches certain distance; and turned off when southbound queue does not reach the threshold
- Customized signal control was modeled using VISSIM/VIURT Idealized Programming (VAP)
- Model was calibrated with RODEL model results as target

WHAT WE LEARNED
- VISWALK models pedestrians in a more realistic way than VISSIM. For example, VISSIM models pedestrians like a vehicle that only move along their lane; while in VISWALK pedestrians walk across street within the entire width of the crossing.
- VISSIM/VISWALK combination provides a good tool in studying a area like downtown that has close interactions between pedestrians, non-motor vehicles and motor vehicles.
- VISSIM can be applied to various types of projects: urban planning, transportation planning, traffic engineering, interchange design and traffic analysis, corridor study, traffic impact study, etc.
- The 3D animation provides visual evaluation of the alternatives.