

The Need for a Transportation Emergency Plan (and the Toronto Experience)

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“An urban emergency will, invariably, result in a
transportation emergency”

Roberto Stopnicki

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Urban events can be small (or large) and planned



Or can be small (and large) but unplanned events



Emergency responders or specialized facilities have specific plans for their need/use



- A Transportation Emergency is:
 - The unplanned disruption of traffic that affects the safety and mobility of road users such as pedestrians, cyclists and drivers
- The impact of an unplanned traffic disruption is a function of
 - the incident area/location
 - The duration of the disruption
 - The frequency of the type of disruption



The need for a Transportation Emergency Plan

- Transportation agencies (departments, divisions, units, etc.) generally do not have specified emergency plans, because of the large number of variables which affect transportation system emergencies:
 - Various types/classifications of roads
 - Causal effect of disruption is unknown
 - Time to start remedial operations is unknown
 - Duration of the impact is unknown
 - Type of response required is unknown

The need for a Transportation Emergency Plan (cont'd)

- It is therefore necessary to normalize the actions followed by transportation agency staff in their response to emergencies, so that these responses can be assessed, prioritized, and effectively implemented. Factors to be considered:
 - Affected Traffic Congestion Area (land use, road type, etc.)
Define with help of other municipality and emergency agencies
 - Anticipated Length of Disruption (type of emergency event) –
Define with help of other transportation agency staff
 - How “serious” is the event (frequency of occurrence) – Define
with help of other municipality emergency agencies

The role of a Transportation Agency after an event

Immediate (Critical) Support:

Transportation Agency is likely charged with the responsibility for the recovery of the emergency area:

- debris removal
- road repair and,
- traffic access

These are activities expected to occur in the first 24 hours after the event

Continued (Essential) Support:

Transportation Agency is likely charged with the responsibility to establish adequate access to and around the emergency area:

- development of detour routes
- temporary roads

These activities expected to occur in the first week after the event



Transportation emergency events should not be classified by their “type” but rather by their category/priority

Low:

- Routine, daily, < 24hr
- Example: Traffic collision, broken water pipe

Medium:

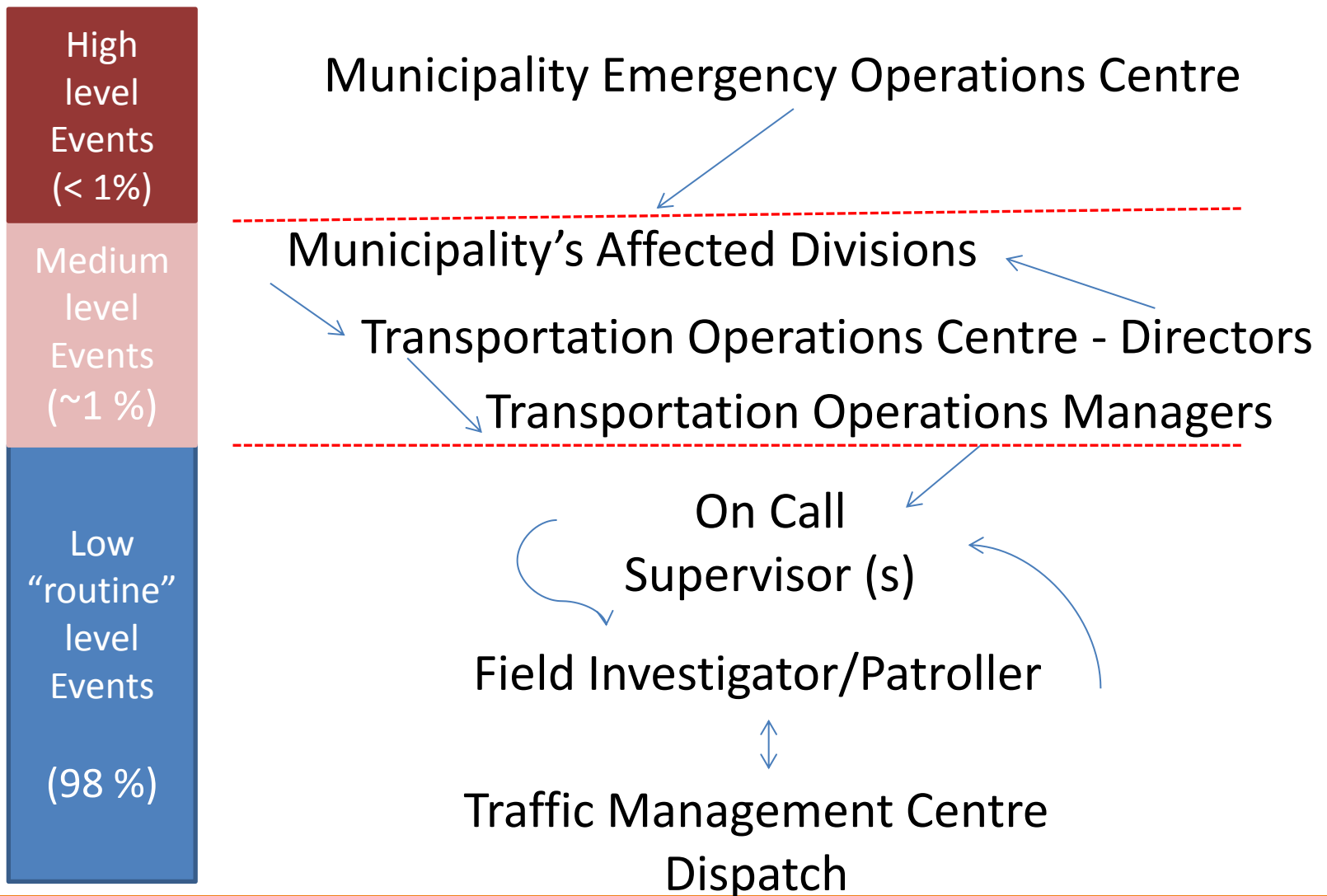
- Major Emergency Incident, 1 in 5/10yrs?, > day-week
- Example: Arterial (Main) Bridge/Road breakdown, Major Snow Storm

High

- City Disaster, 1 in 25/50/100yrs?, > week
- Example: Hurricane, Earthquake, Nuclear evacuation, Expressway collapse

Urban emergency events and their frequencies

Source: Toronto Transportation



What are the principal objectives of a Transportation Emergency Plan?

- To define what an emergency means to a Transportation Agency
- To give Transportation staff clear roles and responsibilities when responding to an incident, particularly during a **“medium”** or **“high”** emergency event;
- Eliminate the need to second guess or reduce response time because of indecisions.
- Eliminate staff anxieties, particularly for those new staff.
- To tie in with the municipality's Emergency Plan
- To tailor/design the plan to the type of business the Transportation Agency performs
- To address the need from all levels within the Transportation Agency to support the incident manager and field staff
- To minimize health and safety risks by being aware of surrounding conditions

What Should an Effective Transportation Emergency Plan Include?

- Predetermined Priority Levels and Associated Actions
- Activity Flow Charts to address the first 24 hours and, then, the week after the event
- Defined Roles and Responsibilities (Checklists)
- Contact Lists to be used during an emergency event
- Summarize all in an Emergency Manual for each responding staff

An example in Toronto's experience

Develop a simple methodology to assess an event's priority:

Rating for area of traffic congestion x

Rating for the estimated duration x

Rating for event type frequency =

EVENT PRIORITY

An example in Toronto's experience (cont'd)

Assign ranking for traffic congestion area

Examples:

- Low (=1) : Local Road Broken Watermain, Collision on a Expressway, Arterial, Collector & Local Roads, Fire or Crime Scene, Local Flooding, Airport Closure, Quarantined Public Area, School Incident
- Medium (=2): Chemical Spill, Gas Explosion, Falling Building Debris, Subway Station Fire
- High (=3): Downtown Evacuation, Bridge Collapse, Broken Arterial Road Watermain, Major Flooding, Major Snow Storm, Nuclear Plant Evacuation

An example in Toronto's experience (Cont'd)

Assign Ranking for Estimate of Duration:

less than 24 hours (=1)

Between a day and a week (=2)

More than one week (=3)

Assign Ranking for event type frequency

Daily, Weekly, Monthly (=1)

Between 5 and 10 years (=2)

Over 25 years (=3)

An example in Toronto's experience (Cont'd)

affected area x estimated duration x frequency = priority

$$3 \times 2 \times 3 = 18$$

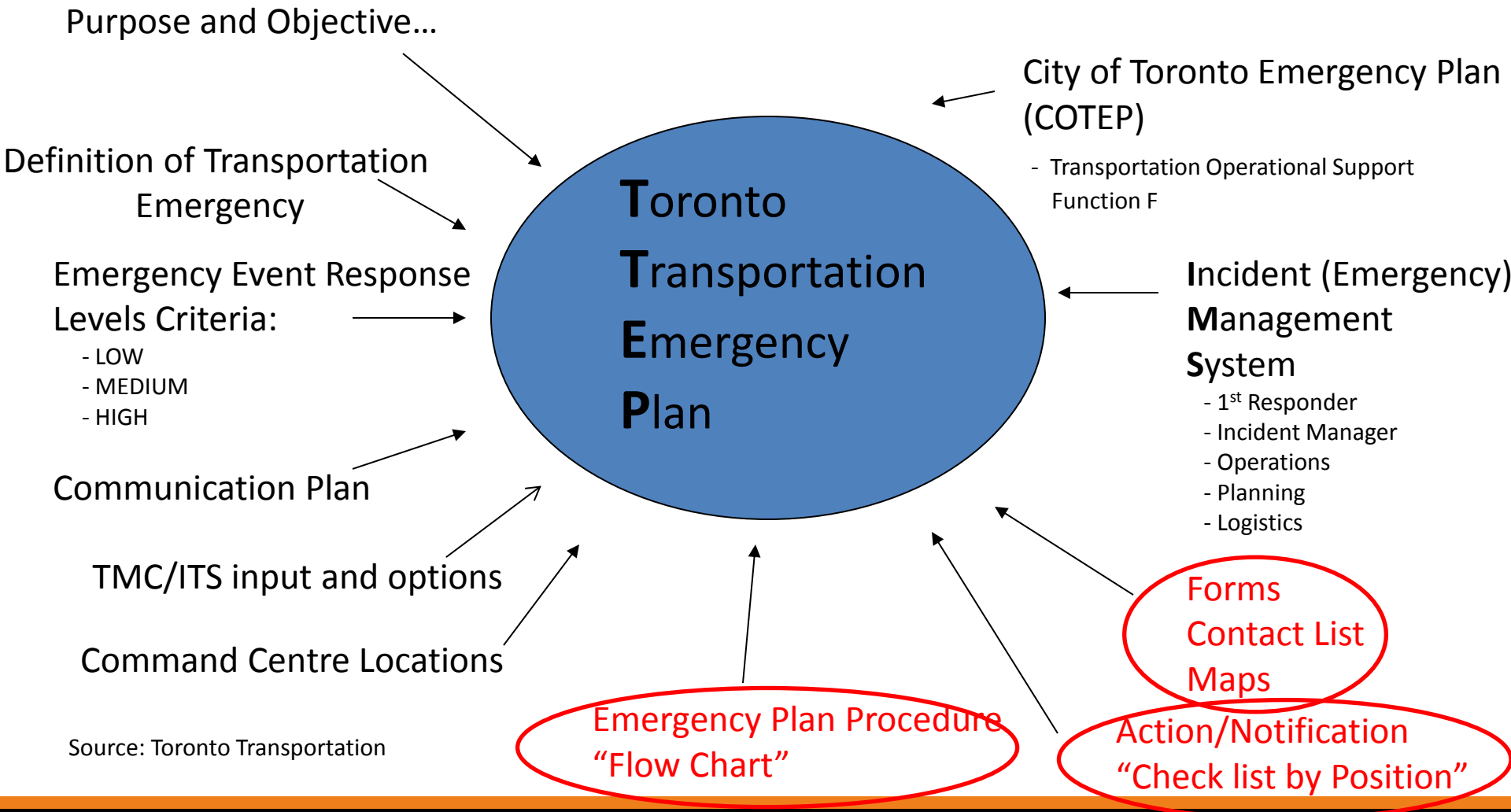
EMERGENCY ROAD CLOSURE EVENTS											
PREDETERMINED PRIORITY LEVEL GUIDE - Factor of Traffic Congestion, Duration & Frequency											
EVENT	LEAD Versus SUPPORTING	TRAFFIC CONGESTION AREA			DURATION			FREQUENCY			SEVERITY
		LOCALIZED	DISTRICT	CITY-WIDE	< 24 Hours	> 24 Hours < Week	> Week	Daily, Weekly & Monthly	Once in 5 to 10 Years	Once in 25, 50, 100 Years	
VALUE LEVEL =		1	2	3	1	2	3	1	2	3	PRIORITY
1 PICKERING NUCLEAR EVACUATION	Support ??			X			X			X	27 HIGH
2 TORNADO - HURRICANE - EARTHQUAKE - WIND STORM - ICE STORM	Support ??			X			X			X	27 HIGH
3 9-1-1 DOWNTOWN EVACUATION	Support Police			X		X				X	18 HIGH
4 MAJOR SNOW STORM - City Wide Snow Removal	Transportation			X			X		X		18 HIGH
5 OFFICE TOWER DOWNTOWN COLLAPSE	Support ??		X				X			X	18 HIGH
6 POWER FAILURE - CITY WIDE	Support ??			X		X			X		12 MEDIUM
7 BRIDGE or ROAD COLLAPSE (Expressway, Arterial, Collector)	Transportation		X				X		X		12 MEDIUM
8 MAJOR ROADWAY FLOODING	Transportation			X		X			X		12 MEDIUM
9 TRAIN DERAILMENT (at a Roadway Crossing)	Support Police		X			X				X	12 MEDIUM
10 PEARSON AIRPORT CLOSURE	Support Airport Authority		X			X				X	12 MEDIUM
11 TTC SUBWAY STATION FIRE	Support Toronto Transit Comm.		X			X				X	12 MEDIUM
12 BROKEN WATERMAIN or Sewer Collapse (on Arterial Road)	Support Water		X			X			X		8 MEDIUM
13 CHLORINE GAS LEAK	Support Fire & Police		X			X			X		8 MEDIUM
14 GAS EXPLOSION	Support Utility		X			X			X		8 MEDIUM
15 HYDRO SUBSTATION EXPLOSION	Support Utility		X			X			X		8 MEDIUM
16 FALLING DEBRIS FROM OFFICE TOWER	Support Police		X			X			X		8 MEDIUM
17 AIRPLANE LANDING ON ARTERIAL ROAD	Support Police		X		X					X	6 MEDIUM
18 CHEMICAL SPILL (Non-Toxic)	Support Fire & Police	X				X			X		4 LOW
19 CHEMICAL SPILL (Toxic)	Support Fire & Water	X				X			X		4 LOW
20 PROTEST OR RIOT	Support Police		X		X				X		4 LOW
21 QUARANTINED PUBLIC AREA (Hospital, Seniors Home, Community Centre)	Support Police & Public Health	X				X			X		4 LOW
22 UNPLANNED SPECIAL EVENT (Maple Leafs Win Stanley Cup)	Support Police		X		X				X		4 LOW
23 POWER FAILURE - LOCAL TRANSFORMER	Support Police & Hydro?	X				X			X		4 LOW
24 COLLISION ON ARTERIAL ROAD	Support Police		X		X			X			2 LOW

HIGH SEVERITY: >17
MEDIUM SEVERITY: 6 to 17
LOW SEVERITY: <6

Source: Toronto Transportation

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Creation of the Toronto Transportation Emergency Plan (TTEP)

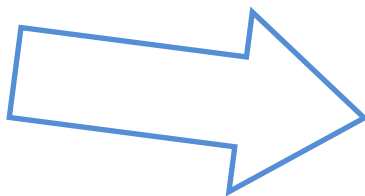


Transportation Emergency Plan

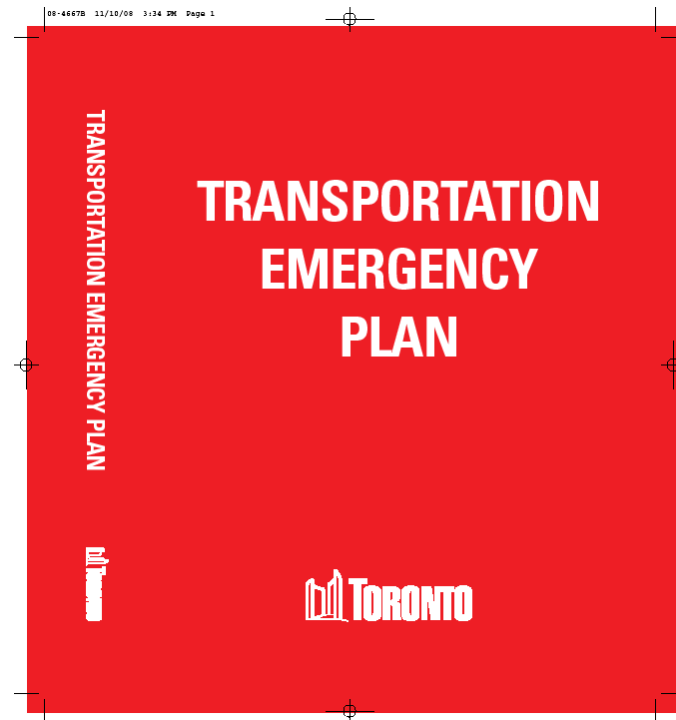
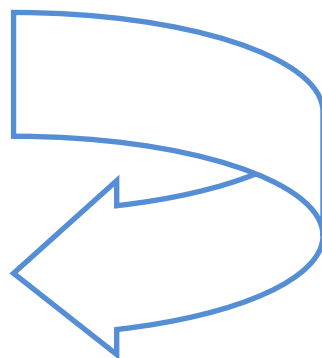
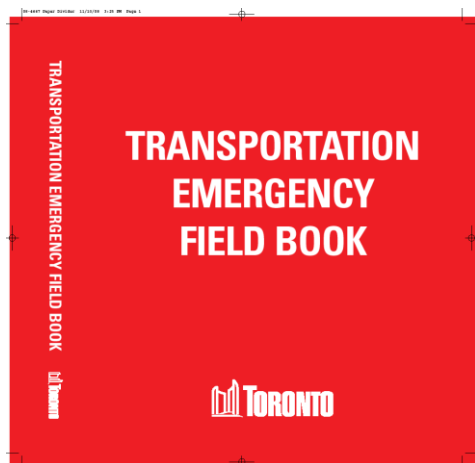
Documentation

2 Parts

Manual (Parent)

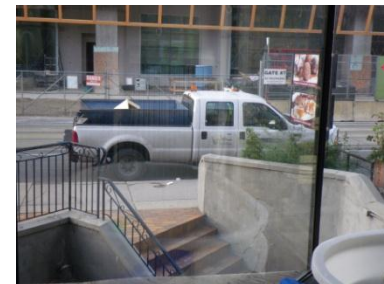
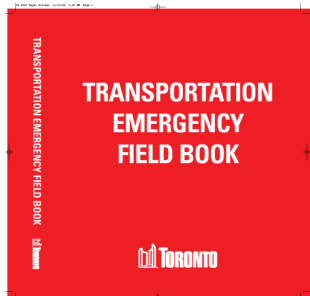


Field Handbook For
Each Staff Position(Child)



Source: Toronto Transportation

Complete the Plan with proper equipment



An emergency plan is a “living” document

- Continuous Review and Update of the Plan
 - Check Against changing Municipality plans and developments
 - Check Against any actual experience in application of the plan
 - Review changes of staffing in the organization and update
- Recurring training
 - Details of the plan
 - Communications protocols
 - Responsibilities
- Recurring (Annual) Exercise
 - “Scenario” development and action

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