Functional Performance Specification (FPS) and Value Engineering Study (VE)

CBSA On-Site Commercial Processing Centre

CSVA 2009 Conference
Ottawa, Ontario
Nov 23 - 24, 2009

Dave Jull P. Eng.
Project Background

- Part of the “Let’s Get Windsor-Essex Moving strategy”
- McCormick Rankin retained to prepare a Master Plan Study to improve operations at the Canada Plaza of the Windsor-Detroit Tunnel
- One component is the proposed On-Site Commercial Processing Centre
- Currently, tagged commercial vehicles have 8 minutes to travel from the Plaza to the existing commercial processing centre along congested City streets
- Proposed On-Site Commercial Processing Centre will enhance safety and operations at the Plaza
Functional Performance Specification Study

- Powerful tool to identify, clarify and set parameters for technical requirements of project
- Without strictly defining the design/solution
- Systematic, disciplined approach to identify the functions needed in a successful project
- Three-day FPS held in Windsor, ON from Sept. 11 to 13, 2007
Functional Performance Specification Study

- **Objectives:**
  - Identify and characterize necessary functions to be provided by the conceptual design of the CBSA OSCPC; and
  - Begin building consensus among the many stakeholders of this important project.
FPS Study Team

- MTO
- City of Windsor
- CBSA
- CRA
- DCTC
- Consultant Team
Main Goal for the CBSA OSCPC

“Consolidate Commercial Operations at Frontier and Accommodate Staff to Increase Security and Efficiency of Border Operations”

Four Main Branches
- Accommodate Operations
- Ensure Security
- Provide Healthy Environment
- Promote Stakeholder Buy-In

Vehicles to be Accommodated in new CBSA OSCPC:
- Trucks
- Busses
- Nexus Vehicles
### CBSA On-Site Commercial Processing Centre

#### Functional Diagram

<table>
<thead>
<tr>
<th>Process Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBSA Border Security</td>
<td>Management of border security activities to prevent illegal entry and exit of persons and goods</td>
</tr>
<tr>
<td>CBSA Customs</td>
<td>Management of customs activities to ensure adherence to customs regulations</td>
</tr>
<tr>
<td>CBSA Immigration</td>
<td>Management of immigration activities to ensure adherence to immigration regulations</td>
</tr>
<tr>
<td>CBSA Taxes</td>
<td>Management of tax activities to ensure adherence to tax regulations</td>
</tr>
</tbody>
</table>

#### CBSA Border Security

1. **Management of Border Security**
   - **Process:** Management of border security activities to prevent illegal entry and exit of persons and goods
   - **Activities:**
     - Management of border security activities to prevent illegal entry and exit of persons and goods
     - Management of border security activities to ensure adherence to border security regulations

2. **Management of Customs**
   - **Process:** Management of customs activities to ensure adherence to customs regulations
   - **Activities:**
     - Management of customs activities to ensure adherence to customs regulations
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3. **Management of Immigration**
   - **Process:** Management of immigration activities to ensure adherence to immigration regulations
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4. **Management of Taxes**
   - **Process:** Management of tax activities to ensure adherence to tax regulations
   - **Activities:**
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## Functional Performance Specification

<table>
<thead>
<tr>
<th>NO.</th>
<th>FUNCTIONS</th>
<th>CRITERIA</th>
<th>LEVEL</th>
<th>FLEX</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Consolidate Commercial Operations at Frontier and Accommodate Staff to Increase Security and Efficiency of Border Operations</td>
<td>Life expectancy &amp; functionality</td>
<td>25 years with one renovation</td>
<td>F3</td>
<td></td>
</tr>
<tr>
<td>0-1</td>
<td>Stay within the Footprint</td>
<td>Meet site plan</td>
<td>Meet it</td>
<td>F0</td>
<td>Require two storey building.</td>
</tr>
<tr>
<td>0-2</td>
<td>Incorporate Needed Design Features</td>
<td>FPS</td>
<td>Satisfy Majority</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>0-3</td>
<td>Integrate with Plaza Operations</td>
<td>Traffic Flow, Site Constraints</td>
<td>Compliance with Master Plan</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>Facilitate Free Flow of Goods and Travelers</td>
<td>Efficient Flow</td>
<td>Minimal delay</td>
<td>F1</td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>Provide Flexibility for Future Change</td>
<td>Usage Flexibility</td>
<td>High degree of flexibility when designing systems</td>
<td>F1</td>
<td>Based on business, government and policy changes</td>
</tr>
<tr>
<td>1</td>
<td>Accommodate Operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Accommodate Commercial Operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1</td>
<td>Provide Commercial Work Space</td>
<td>First floor in controlled area</td>
<td>Compliance</td>
<td>F0</td>
<td></td>
</tr>
<tr>
<td>1.1.1.1</td>
<td>Provide Supervisor Offices</td>
<td>No. of offices</td>
<td>2 offices</td>
<td>F1</td>
<td>On first floor in controlled area</td>
</tr>
<tr>
<td>1.1.1.2</td>
<td>Provide Administrative Area</td>
<td>No. of work spaces</td>
<td>12 work spaces</td>
<td>F2</td>
<td>On first floor in controlled area</td>
</tr>
<tr>
<td>1.1.2</td>
<td>Support CBSA Operations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.2.1</td>
<td>House Meeting Rooms</td>
<td>Size</td>
<td>8 to 10 persons</td>
<td>F1</td>
<td>Boardroom table, AV equipment, voice and data outlets for 8 to 10 people</td>
</tr>
<tr>
<td>1.1.2.2</td>
<td>House Lunch/Break Room</td>
<td>Size</td>
<td>2 tables of 4</td>
<td>F1</td>
<td>Need fridge, vending machines, TV, fridge, microwave, sink, counter and cupboards</td>
</tr>
<tr>
<td>1.1.2.3</td>
<td>House IT</td>
<td>CRA standards to serve the entire site as NCC, type of equipment</td>
<td>5 cabinets (30 by 42 inch) with sufficient room to walk around the cabinets, for cooling and ventilation systems and lab bench (6 ft by 3 ft)</td>
<td>F1</td>
<td>This becomes the main communication room for the site. Need RCR on 1st floor and NCC on 2nd floor. Lockable doors. Spec. to be provided</td>
</tr>
</tbody>
</table>
Post FPS Workshop: Base Case Development

- Using the FPS, Architects developed the following for the new CBSA OSCPC:
  - Base Case Design
  - Draft Area Summary Sheets
  - Draft Space Data Sheets
  - Alternative 1
Base Case – One Storey Building

- Order of Magnitude Cost Estimate:
  - Building: $1.98M
  - Canopies: $0.17M
  - Total: $2.15 M
## Area Summary Sheets

### WINDSOR TUNNEL PUBLIC & OFFICE SPACES

<table>
<thead>
<tr>
<th>Room #</th>
<th>Space Name</th>
<th>Capacity</th>
<th>Area (sqm)</th>
<th>Area (sqf)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>PUBLIC ENTRANCE/SPACES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A1.1</td>
<td>Vestibule</td>
<td>n/a</td>
<td>12.0</td>
<td>129</td>
<td></td>
</tr>
<tr>
<td>A1.2</td>
<td>Counter &amp; Waiting</td>
<td>n/a</td>
<td>93.0</td>
<td>1,001</td>
<td></td>
</tr>
<tr>
<td>A1.3</td>
<td>Bus Queuing</td>
<td>n/a</td>
<td>0.0</td>
<td>0</td>
<td>part of counter &amp; waiting area</td>
</tr>
<tr>
<td>A1.4</td>
<td>Cashier</td>
<td>n/a</td>
<td>0.0</td>
<td>0</td>
<td>part of counter &amp; waiting area</td>
</tr>
<tr>
<td>A1.5</td>
<td>Public Male Washroom</td>
<td>n/a</td>
<td>5.0</td>
<td>54</td>
<td>barrier free</td>
</tr>
<tr>
<td>A1.6</td>
<td>Public Female Washroom</td>
<td>n/a</td>
<td>5.0</td>
<td>54</td>
<td>barrier free</td>
</tr>
<tr>
<td>B1</td>
<td>SECURITY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1.1</td>
<td>Interview Room</td>
<td>n/a</td>
<td>15.0</td>
<td>161</td>
<td></td>
</tr>
<tr>
<td>B1.2</td>
<td>Radio Equipment</td>
<td>n/a</td>
<td>10.0</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>B1.3</td>
<td>Detention Facility</td>
<td>2</td>
<td>20.0</td>
<td>215</td>
<td></td>
</tr>
<tr>
<td>B1.4</td>
<td>Hold Goods Room</td>
<td>n/a</td>
<td>11.0</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>B1.5</td>
<td>Firearm Storage</td>
<td>n/a</td>
<td>11.0</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>B1.6</td>
<td>Equipment Room</td>
<td>n/a</td>
<td>13.0</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>B1.7</td>
<td>Eye wash station</td>
<td>n/a</td>
<td>2.0</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>B1.8</td>
<td>Evidence Locker Room</td>
<td>n/a</td>
<td>15.0</td>
<td>161</td>
<td></td>
</tr>
<tr>
<td>B1.9</td>
<td>Network Communications Centre</td>
<td>n/a</td>
<td>0</td>
<td>part of evidence Locker room?</td>
<td></td>
</tr>
<tr>
<td>B1.10</td>
<td>Quarantine Cage</td>
<td>n/a</td>
<td>10.0</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>B1.11</td>
<td>First Aid Room</td>
<td>1</td>
<td>11.0</td>
<td>118</td>
<td></td>
</tr>
</tbody>
</table>
# SPACE DATA

**Space Name:** Counter, Queuing & Waiting  
**Space:** A1.2

<table>
<thead>
<tr>
<th>Net Area</th>
<th>Ceiling Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>190.0 sm</td>
<td>2045 sf 2.6 m</td>
</tr>
<tr>
<td>9 ft</td>
<td></td>
</tr>
</tbody>
</table>

**Function:** Queuing for bus passengers, kiosk (2), ability for 3rd line at counter (counter kiosk), minimal seating for waiting.

**Adjacent:** Vestibule, public washrooms,  
**Hours of Use:** 24 hours

**Expansion:** Operation will never grow beyond processing/offloading one bus at a time  
**Flexibility:** Queuing should be flexible

**Finish:**  
- **Floor:** non-slip tile  
- **Ceiling:** acoustical ceiling tile  
- **Walls:** painted drywall

**Natural Light:** X required

**Doors:**

**Security:**

**Occupants:**  
- # of full-time: 20-48  
- # of occasional visits:  
- X regular visitors  
- _ seldom

**Acoustics:**  
- Privacy:  
- Concentration:  
- Equipment:  
- NC Rating: 45

**Safety and Health:**  
- Fumes:  
- Dust:  
- Fire/Smoke hazards:  
- Noise and vibration:  
- Moisture:  
- Spillage:  
- Corrosive: X  
- Video surveillance: _

**Mechanical Requirements:**

**Equipment:**  
(Large counter unit to accommodate individual & group and small counter space for completing forms. Counters to be barrier-free as required)

**Seating Area:**

**Additional Comments:**  
“Crush” capacity 48 bus passengers, 5 bus/nexus, 1 broker,  
Line of sight across, visibility, openness  
Space for discreet secondary luggage examination immediately adjacent to kiosk.

**Date Prepared:** Oct. 15.07  
**Prepared By:** C. Nguyen  
**Revised:** Oct. 17.07  
**Revised By:** FPS, VE Team
VE Objectives

- City of Windsor and Transport Canada
  - Best facility to accommodate traffic

- CBSA and Transport Canada
  - Identify and characterize necessary functions to be provided by the conceptual design of the CBSA OSCPC; and
  - Begin building consensus among the many stakeholders of this important project.

- MTO
  - Fit within the overall Master Planning Study
## Summary of Creative Ideas

<table>
<thead>
<tr>
<th>No. of Ideas Identified</th>
<th>System</th>
<th>No. of VE Proposals</th>
<th>No. of Design Suggestions</th>
<th>No. of Design Requirements</th>
<th>No. of Ideas Developed with Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>Secure Area</td>
<td>21</td>
<td>14</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>Public Spaces</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>Site</td>
<td>12</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>88</td>
<td>Summary</td>
<td>35</td>
<td>22</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>SA-26</td>
<td>Ensure lighting is recessed in detention cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA-27</td>
<td>Used epoxy coated floors in detention cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA-28</td>
<td>Video surveillance inside and outside detention cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA-36</td>
<td>Lockable safe and monitoring equipment in commercial supervisors office</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Design Requirements cont’d

<table>
<thead>
<tr>
<th>Idea No.</th>
<th>Description</th>
<th>SF Impact</th>
<th>$ Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA-3</td>
<td>Combine the radio equipment room with another space</td>
<td>-90</td>
<td>-$13,800</td>
</tr>
<tr>
<td>SA-8</td>
<td>118 sq ft hold goods room (includes evidence locker room)</td>
<td>-161</td>
<td>-$24,700</td>
</tr>
<tr>
<td>SA-9</td>
<td>Lockable gun storage in lockers vs fire arm storage room (becomes 2nd interview room)</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>SA-10</td>
<td>Tool cabinet at dock in lieu of equipment room</td>
<td>0</td>
<td>$0</td>
</tr>
<tr>
<td>SA-11</td>
<td>Reduce the size of the first aid room</td>
<td>-58</td>
<td>-$8,900</td>
</tr>
<tr>
<td>SA-17</td>
<td>Eliminate staff entrance vestibule</td>
<td>-86</td>
<td>-$13,200</td>
</tr>
<tr>
<td>SA-19</td>
<td>Increase the IT and lab room to 200 sq ft (includes all services such as security cameras)</td>
<td>+39</td>
<td>+$9,200</td>
</tr>
<tr>
<td>SA-21</td>
<td>Reduce the size of the lunch room</td>
<td>-174</td>
<td>-$26,700</td>
</tr>
<tr>
<td>SA-47</td>
<td>Larger office for commercial supervisor</td>
<td>-108</td>
<td>-$16,400</td>
</tr>
<tr>
<td>SA-48</td>
<td>Two cabinets in lieu of office supply storage room</td>
<td>+21</td>
<td>+$3,200</td>
</tr>
</tbody>
</table>
SA-13: Include 10m² (108 ft²) Cable Entry and Miscellaneous Communications Room

- **Alternative Design:**
  - The proposal would be to construct a separate room for termination and splicing of Telecom Carrier and other 3rd Party Cables requiring
  - This room would also be used to house all Non CBSA IT and Telecom Equipment.
  - This would increase the overall program space by 10m² (108 ft²).

- **Advantages of Change:**
  - This provides the physical separation of CBSA equipment from other service providers which is an identified requirement

- **Disadvantages of Change:**
  - Additional Program Space

- **Estimated Additional Capital Cost:** $16,567
Truck Maneuvering Simulation
S-9: Remove the canopy extension to the main building

- Estimated Capital Cost Savings:
  - $46,375
S-19: Provide 3rd Truck Slot with One Closest to the Building Also Used For Nexus

- Estimated Capital Cost Savings: $31,870
S-24: Keep 5 Bays in Existing Maintenance Facility as Warehouse Space

- Estimated Capital Cost Savings:
  - $150,094
S-26: Option 2 (Two Storey)

- Order of Magnitude Cost Estimate:
  - Building: $2.26M
  - Canopies: 0.14M
  - Total: $2.4 M
S-21: Option 3 (One Storey)

- **Order of Magnitude Cost Estimate:**
  - Building: $2.18M
  - Canopies: 0.13M
  - Total: $2.31M
  - Optional Inspection Bay is an additional $0.89M
Questions

For Further Information:

Dave Jull – JullD@mmm.ca