

From Demand to Resource Analysis

Dave Henrys

Associate, APSE Solutions

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- **Assessing demand**
- **Managing demand**
- **Critical examination**
- **Resource analysis**

Assessing Demand

- Feature types
- Agreed standards
- Bill of quantities



Feature types

feature_type_name	unit_name	measurement_name	type_quantity	feature_group_code	feature_group_name	measurement_code
Rough Grass Embankments	LIN. METRE	HARD EDGE	0	GR1	Grassland	HE
Rough Grass Embankments	LIN. METRE	LIN. METRE	89	GR1	Grassland	LI
Rough Grass Embankments	LIN. METRE	SOFT EDGE	0	GR1	Grassland	SE
Rough Grass Embankments	SQ.METRE	SQ.METRE	43448	GR1	Grassland	SQ
Rough Grass Embankments	SQ.METRE	UNMAINTAINED AREAS	0	GR1	Grassland	SU
Rough Grass Embankments	NUMBER	UNMAINTAINED LENGTH OR NUMBER	0	GR1	Grassland	LU
General Rough Grass	LIN. METRE	HARD EDGE	0	GR1	Grassland	HE
General Rough Grass	LIN. METRE	LIN. METRE	5186	GR1	Grassland	LI
General Rough Grass	LIN. METRE	SOFT EDGE	230	GR1	Grassland	SE
General Rough Grass	SQ.METRE	SQ.METRE	139950	GR1	Grassland	SQ
General Rough Grass	SQ.METRE	UNMAINTAINED AREAS	0	GR1	Grassland	SU
General Rough Grass	NUMBER	UNMAINTAINED LENGTH OR NUMBER	0	GR1	Grassland	LU
High Amenity Boxed Grass	LIN. METRE	HARD EDGE	16669	GR1	Grassland	HE
High Amenity Boxed Grass	LIN. METRE	LIN. METRE	15170	GR1	Grassland	LI
High Amenity Boxed Grass	LIN. METRE	SOFT EDGE	270	GR1	Grassland	SE
High Amenity Boxed Grass	SQ.METRE	SQ.METRE	63435	GR1	Grassland	SQ
High Amenity Boxed Grass	SQ.METRE	UNMAINTAINED AREAS	0	GR1	Grassland	SU
High Amenity Boxed Grass	NUMBER	UNMAINTAINED LENGTH OR NUMBER	0	GR1	Grassland	LU
High Amen. Boxed Grass	LIN. METRE	HARD EDGE	795.2	GR1	Grassland	HE
High Amen. Boxed Grass	LIN. METRE	LIN. METRE	118132.19	GR1	Grassland	LI
High Amen. Boxed Grass	LIN. METRE	SOFT EDGE	173.9	GR1	Grassland	SE
High Amen. Boxed Grass	SQ.METRE	SQ.METRE	254932.75	GR1	Grassland	SQ
High Amen. Boxed Grass	SQ.METRE	UNMAINTAINED AREAS	0	GR1	Grassland	SU
High Amen. Boxed Grass	NUMBER	UNMAINTAINED LENGTH OR NUMBER	0	GR1	Grassland	LU
General Amenity Grass	LIN. METRE	HARD EDGE	880	GR1	Grassland	HE
General Amenity Grass	LIN. METRE	LIN. METRE	74404	GR1	Grassland	LI
General Amenity Grass	LIN. METRE	SOFT EDGE	0	GR1	Grassland	SE
General Amenity Grass	SQ.METRE	SQ.METRE	752873	GR1	Grassland	SQ
General Amenity Grass	SQ.METRE	UNMAINTAINED AREAS	0	GR1	Grassland	SU
General Amenity Grass	NUMBER	UNMAINTAINED LENGTH OR NUMBER	0	GR1	Grassland	LU

Setting standards

- **Grass height v. number of cuts (quality v. quantity)**
- **Priority areas**
- **Lower maintenance areas**
- **Street cleansing – land use zones**
- **Litter bins**
- **Sweeping when necessary**
- **Deeper cleanse**
- **Flower / shrub beds**
- **Formal parks**
- **Grass edges**

Bills of Quantities

Spec Ref	Description	Measurement	UOM	Freq/Ann
	<i>WPC 001 Briers Way Open Space</i>			
	Grass Areas			
2.5	Mow General Grass Areas	910.47	Sm	14
2.3	Pick Litter	910.47	Sm	52
2.3	Rake Up Leaves	91	Sm	2
2.3	Sweeping			
	Sweep Paths	67.3	Lm	6
2.4	Weedspraying			
	Apply Residual Herbicide Fenceline	14.5	Lm	1
2.6	Shrub Bed Maintenance			
	Fork Over Shrubbery	701.18	Sm	1
	Prune Shrubs	701.18	Sm	1
	Apply Granular Herbicide	701.18	Sm	1
	Spot Treat W/- Resid Herb.	701.18	Sm	2
	Pick Litter	701.18	Sm	52
	Rake Up Leaves	70	Sm	2

Demand

- Where does demand for the service come from?
- How can demand be reduced?
- Tackling causes not symptoms

Different strategies for different demand curves

Cleaning Streets

- Frequency driven
- Being there rather than needing to be there
- Little scope for reducing input and therefore, cost, without complaints
- May have low impact on littering behaviour
- Upward pressure on demand

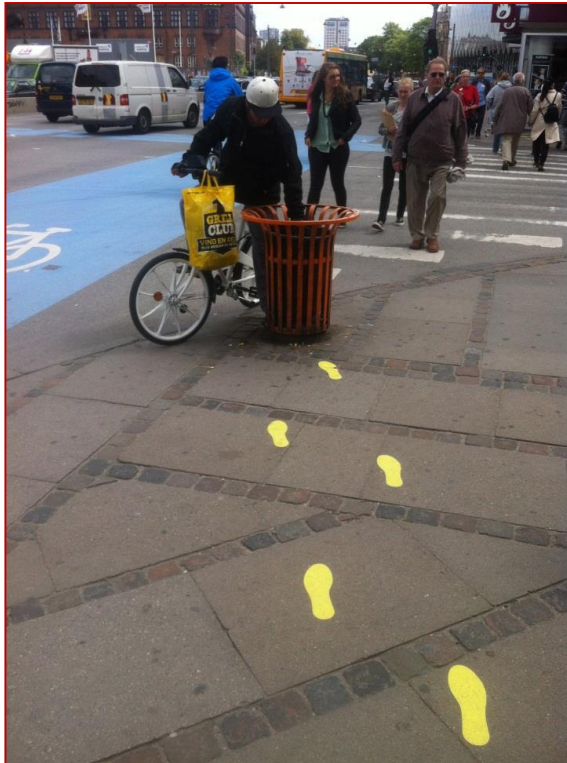
Keeping Streets clean

- Cleaning as a last resort
- Only when necessary
- Primary emphasis on prevention through engagement, education and enforcement
- May have higher impact on behaviour
- Downward pressure on demand

Behaviour change

“Nudge” theory example:

Original experiment in Copenhagen reduced littering by 46%



Behaviour change

“Nudge” theory examples:



Behaviour change

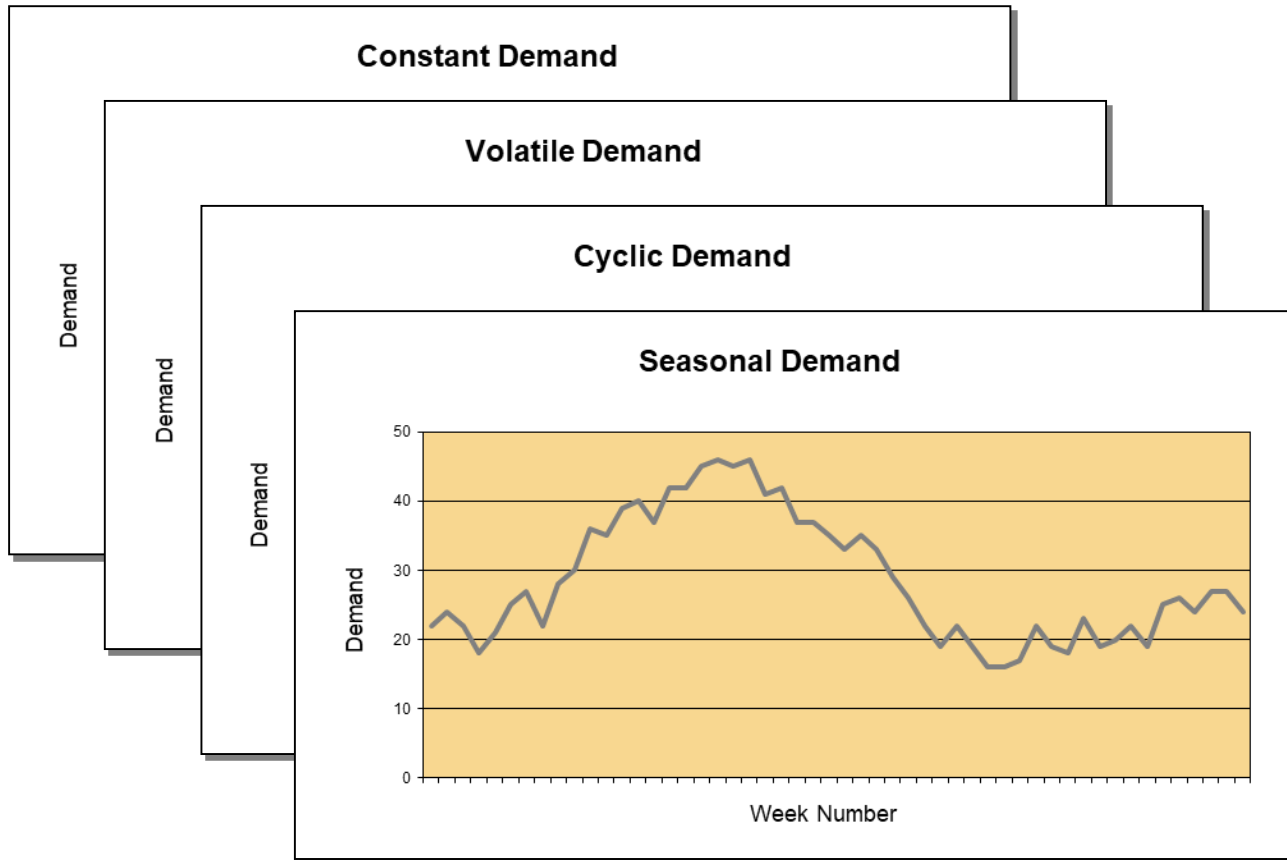
Discouraging Flyposting



Understanding the Business Need

- **Establishing the work demand**
- **Meeting the demand**
 - **Working hours?**
 - **Cover?**
 - **Shifts?**
 - **Overtime?**

What is the work demand?



Examples of work demands

Constant demand

- Bin collection
- Litter picking



Volatile demand

- Call centres
- Graffiti removal



Examples of work demands

Cyclic demand

- **Street cleansing**
- **Play area checks**

Seasonal demand

- **Grass cutting**
- **Green waste collection**
- **Winter maintenance**



Considerations / Constraints

- Growing season
- Dark mornings / afternoons
- Noise levels – sweeping / mowing
- School run routes
- Parked cars
- Planned events

Critical Examination

<u>WHAT is achieved?</u>	<u>Is It Necessary?</u> <u>(if so - WHY?)</u>	<u>What ELSE could be done?</u>	<u>What SHOULD be done?</u>
<u>WHERE is it done?</u>	<u>WHY THERE?</u>	<u>Where ELSE could it be done?</u>	<u>Where SHOULD it be done?</u>
<u>WHEN is it done?</u>	<u>WHY THEN?</u>	<u>When ELSE could it be done?</u>	<u>When SHOULD it be done?</u>
<u>WHO does it?</u>	<u>WHY THAT PERSON?</u>	<u>Who ELSE could do it?</u>	<u>Who SHOULD do it?</u>
<u>HOW is it done</u>	<u>WHY THAT WAY?</u>	<u>How ELSE could it be done?</u>	<u>How SHOULD it be done?</u>

Critical Examination

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Identify

Challenge

Brainstorm

Requirement

EXAMPLE – Street Cleansing

What should be done?

- **The Law:**

ENVIRONMENTAL PROTECTION ACT 1990

- “places a duty on each local authority to ensure that the land is, so far as is practicable, kept clear of litter and refuse.”

- **COPLAR:**

Code of Practice on Litter and Refuse (2006)

- “sets out minimum standards of cleanliness for relevant land and the maximum response times to return land to be free from litter and refuse if it falls below the minimum standard”

Where should it be done?

- **Zoning is based on location and land use inc.**

Zone 1 town centres, shopping centres & shopping streets; central car parks; other busy public places; local roads within these areas

Zone 2 high density residential areas; busy recreational land; suburban car parks; high density industrial estates; local roads within these areas

Zone 3 low density residential areas; low density industrial estates; local roads within these areas

Zone 4 rural / semi rural roads that do not directly link towns & villages

Zone 7 rural roads linking towns and villages

When should it be done?

Category Zone		CLEANLINESS STANDARD			
		A	B	C	D
1	TOWN CENTRES ETC.	← 6hrs	← 3 Hrs	← 1 Hr	
2	HIGH DENSITY RESIDENTIAL ETC.	← 12 Hrs	← 6 Hrs	← 3 Hrs	
3	LOW DENSITY RESIDENTIAL ETC.	← 2 weeks	← 12 Hrs	← 6 Hrs	
4	AREAS NOT FALLING INTO ZONES 1-3	← 2 weeks	← 1 week	← 60 Hrs	
7a	LOCAL ROADS (Hard Surface Areas)	← 2 weeks	← 5 days		
7b	LOCAL ROADS (Grassed Areas)		← 2 weeks	← 5 days	

Who should do it?



Manual or Mechanical ?

How should it be done?

- Sweeping routes based on time study data to match zonings?
- Neighbourhood / area based?
- Mix of manual & mechanical using local knowledge
- Timing of operation for most efficient use of resources

How should it be done?

Grade A



A Grade A area has no litter or refuse, it is the standard which thorough conventional sweeping/litter-picking should achieve.

Resource Analysis

- **How much work is involved?**
- **How much work can be achieved?**
 - **Grass cutting area per cycle**
 - **KM swept per day**
 - **Bins emptied per day**
- **Standard Minute Values**



Resource Analysis

- **Example:-**



Johnston VT651 Road Sweeper

Resource Analysis

Johnston VT651 Road Sweeper

- $SMV = 8.57$ std mins / km (housing estate)
- 7.4 hour working day = 444 minutes
- Est. 60% productivity = 266.4 minutes
- Inc. travel, tipping, refill water, personal time, admin.
- **31.09 km sweeping target per day**

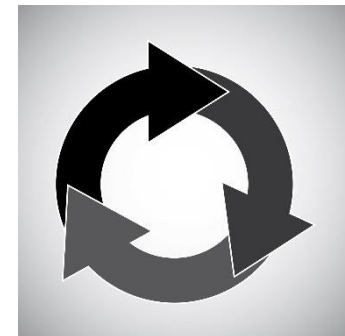
Resource Analysis

Critical Examination established

- Housing estates require a four-weekly channel sweep to ensure that EPA standard is achieved. **(WHAT)**
- There are 603 km of roads to be swept within area. **(WHERE)**
- They can be swept between 8:00 a.m. and 4:00 p.m. on weekdays (avoiding school runs etc.) **(WHEN)**
 - 603 km @ 31.09 km per day = 19.4 days
- Mechanical channel sweeper + HGV driver **(WHO)**
- Follow optimised route plans **(HOW)**

Resource Analysis

- **Basic example shows resource requirement for one task.**
- **Build up of analysis to complete the whole picture.**
- **How does this match with the budget?**
- **Might need to reassess demand!**



Contact details

Dave Henrys

Email: mail@eqip.co.uk

Association for Public Service Excellence

3rd Floor, Trafford House, Chester Road

Manchester M32 0RS

telephone: 0161 772 1810

fax: 0161 772 1811

web: www.apse.org.uk

