



**INTERNATIONAL
CARWASH
ASSOCIATION®**

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Water Use in the Professional Car Wash Industry

International Carwash Association

- Trade association representing the professional car wash industry
- 2000 members worldwide, representing 15,000 car washes
- Focus on trade, education, research and advocacy

Study Information

- Original study conducted in 2002
- Measured water use, evaporation and carry out in commercial car washes
 - Conducted in three markets - Orlando, Phoenix and Boston
- Recent study conducted in summer of 2017
 - One market – Northern California
- Both studies conducted by Chris Brown Consulting

Agenda

- Water Use in Conveyor Car Wash
- Water Use in an In-Bay Automatic Car Wash
- Use of Reclaim
- Conclusions
- Perspectives from a Car Wash Owner and Customer

Methodology

- Doppler meter inserted in the final discharge pipe from the car wash separation tank to the sanitary sewer.
- Only car wash water was counted
- Metered water supply tracked and compared to the discharge.
- Six conveyor car washes
- Six in-bay automatic car washes

Methodology

- Evaporation and carryout calculated by averaging the total freshwater purchased per vehicle versus the wastewater discharged per vehicle
- Reclaim* values determined by accounting for number and type of water uses supplied by:
 - Freshwater
 - reclaim water
 - spot free water

*Presented in ratio of gallons of reclaim to freshwater

Conveyor Car Wash



- Car is pulled through a tunnel
- Configuration is different for every car wash, including length of tunnel and type and amount of washing equipment used
- Typically includes high pressure washing, with soft cloth and soap applications. Includes a final rinse.
- Three components to washing
 - Chemical
 - Friction
 - Water

Conveyor Car Wash

Pre-soak	An automated nozzle or hand held spray.	It was present in all of the washes in this study. It is not found in all car washes.
Wash	High-pressure spray or cloth material with detergent solution.	According to industry reports, almost all conveyors now use cloth features
Rocker panel/undercarriage -	Cloth material or high pressure sprays on sides and bottom of vehicle.	In a conveyor these may be operated on independent arms or carriages that spray upward from below or beside the vehicle. All sites used reclaim water.
First Rinse	Typically a high-pressure water rinse	Can use reclaim or freshwater. Not spot free.
Wax/Sealers/Polishes	An optional surface finish is sprayed on the vehicle.	Typically freshwater, although in some cases, spot free reject water, or highly treated reclaim water will be used.
Final Rinse	Low-pressure rinse	Spot free rinse with fresh or membrane-filtered/deionized water.

Reverse Osmosis

- Most facilities used Reverse Osmosis (RO) to produce spot free water in the final rinse
- Reject water is directed in to the reclaim tanks for use in a future wash cycle

Evaporation and Carry Out

- Amount is not directly measurable but estimated
- Water input – water outflow + change in storage
 - Change in storage irrelevant in this study as RO storage tanks were topped up each day and separation tanks were full at the beginning and end of the study period

Evaporation and Carryout Values

Table C1

Freshwater Use, Evaporation and Carryout in Conveyor Car Washes (California, 2017)

<u>Car Wash</u>	<u>Freshwater GPV</u>	<u>GPV E & C</u>	<u>Percent E&C</u>
CA	27.4	6.1	22.2
CB	23.3	5.7	24.5
CC	31.1	5.0	16.0
CD	23.7	6.1	25.9
CE	37.9	6.3	16.6
CF	36.5	8.5	23.3
Average	30.0	6.3	21.4
StDev	6.3	1.2	4.15

Table C2

Conveyor Car Wash Values (2002 ICA Study)

	Freshwater GPV	GPV E & C	Percent E&C
Orlando	34.3	5.2	15.1
Boston Area	26.7	4.3	16.1
Phoenix	43.8	7.3	16.7

In-Bay Automatic Car Wash



- Car remains stationary while equipment moves around the car
- Typically found in gas station/self-service applications
- Friction vs. touchless
- More uniform application than conveyor washes

In-Bay Automatic Car Wash

Presoak	Initial low pressure pass	Contains solutions to help lift dirt off vehicle surface
Wash	High pressure pass in the touchless washes –or– Cloth brushes, which are watered with low pressure sprays	May use reclaim water
Hub scrub	A circular brush which removes dirt and shines the hubcaps and tires –or– a high pressure spray	When equipment is present
First rinse	Typically low pressure.	To remove solutions still on the vehicle surface.
Clear coat	Low pressure spray	Contains solutions to protect the vehicle finish
Final rinse	Low pressure. Spot free water	Treated to remove small suspended solids which can leave spots as the vehicle dries.

Evaporation and Carry Out Values

Table I-1

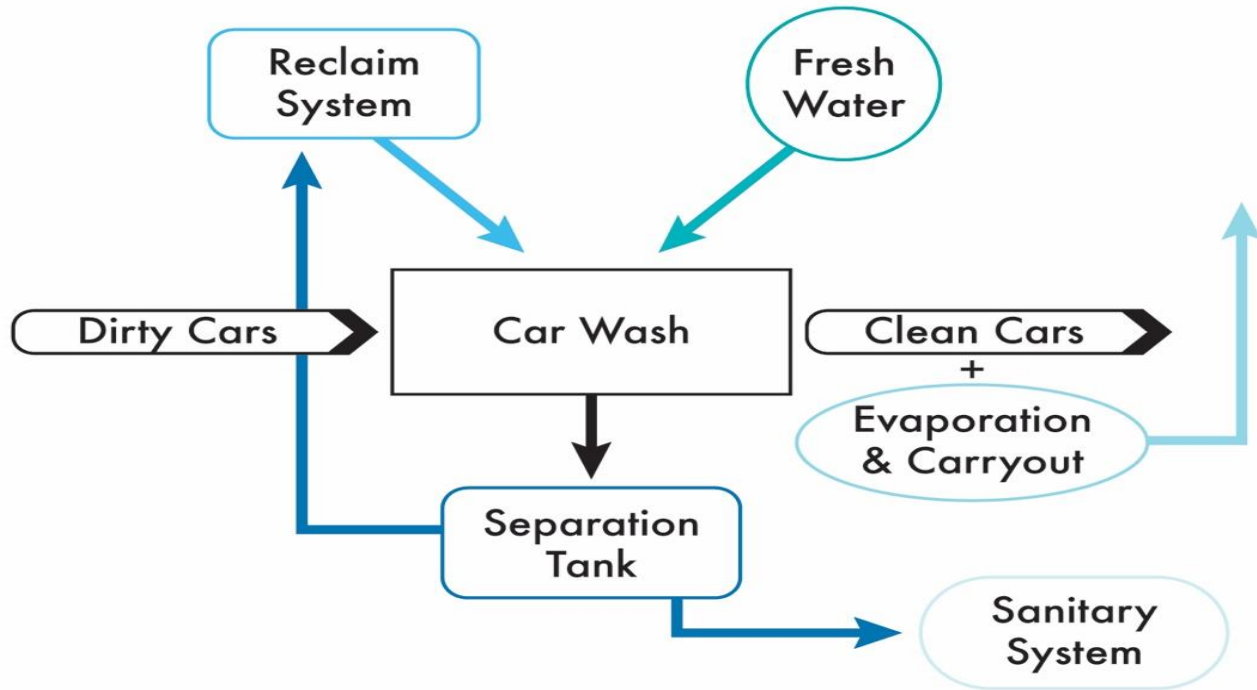
Freshwater Use, Evaporation and Carryout (California, 2017)

Car Wash	Freshwater GPV	GPV E & C	Percent E&C
IA	45.3	9.8	21.7
IB	50.1	10	20.6
IC	26.8	7.1	26.4
ID	29.9	7.8	26.1
IE	70.5	11	15.6
IF	46.2	6.0	13
Average	44.8	8.7	20.6
StDev	15.7	1.99	5.4

Table I-2

In Bay Automatic Car Wash Values (2002 ICA Study)

	Freshwater GPV	GPV E & C	Percent E&C
Orlando	24.6	7.3	29.8
Boston Area	40.0	11.4	28.6
Phoenix	72.5	23.8	32.8



Reclaim Use in a Car Wash

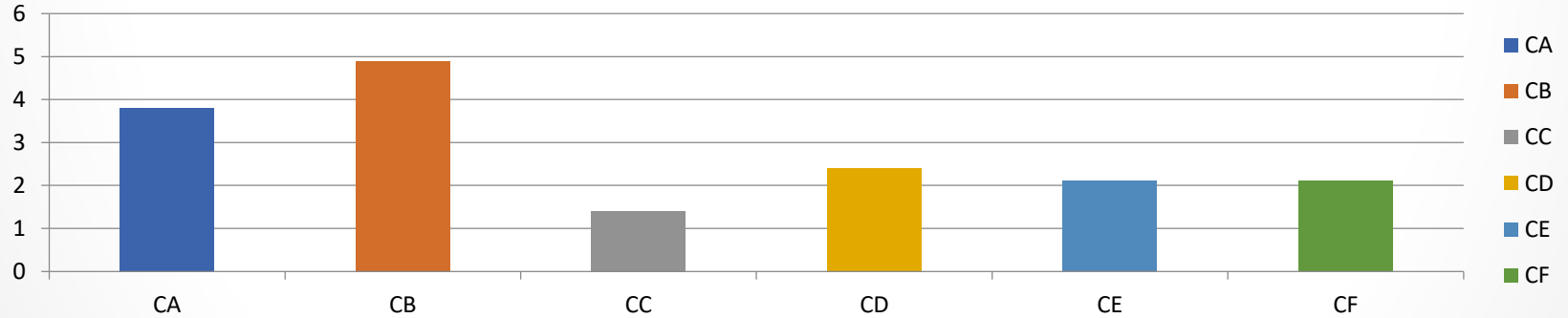
- Filters which remove all particles above 5 microns are sufficient for all cycles except the spot-free rinse.
- Many facilities also have a RO unit to produce spot-free water.
- Reject water can be used:
 - In reclaim cycles
 - To landscape
 - Other cycles prior to the spot-free rinse

Reclaim Use in a Car Wash

- Study measured and reported reclaim water as the number of gallons per gallon of fresh water used per vehicle.
- Compared to 2002 study, all of the sites were using a reclaim system within their wash.

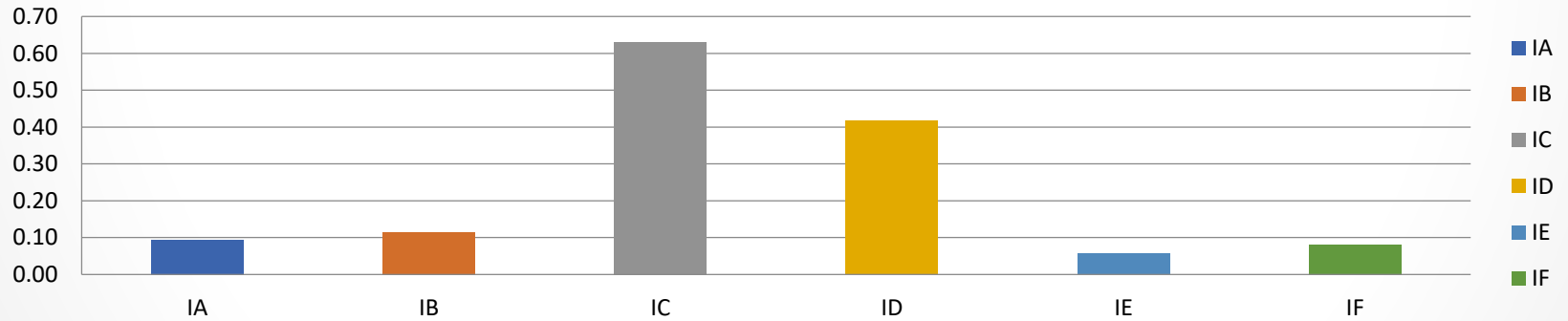
Reclaim in a Conveyor Car Wash

**Reclaim to Freshwater Ratios (Gals/Gals)
for Six Conveyor Car Washes**



Reclaim in an In-Bay Automatic Wash

**Reclaim to Freshwater Ratios (Gals/Gals)
for Six In Bay Car Washes**



Conclusions

- Numbers will vary in a conveyor wash due to length and variations of equipment. However, fresh water used per vehicle is relatively low, due to reclaim use.
- Compared to the 2002 study, conveyor car washes are using less gallons of fresh water per vehicle.
- More conveyor sites are using reclaim than they were in 2002.
- Reclaim water is making up more than 50% of the water applied in a conveyor wash.
- Use of reclaim will lead to greater water savings in an in-bay automatic car wash.

Conclusions

- In-bay Automatics can realize greater water savings by using their reclaim system in multiple wash applications
- Evaporation and carry out is much higher in an in-bay automatic car wash and can account for almost 1 of every 5 gallons of fresh water used.

Conclusions

- The most noticeable difference between in-bay automatics and conveyor washes is the amount of evaporation and carryout per vehicle
 - Conveyor: 6.3 GPV
 - In-Bay Automatic: 8.7 GPV
- Reasons include:
 - Area of the trench versus the manhole that recovers water
 - Mist from high pressure cycles in the in-bay exit the wash
 - Increased use of dryers in a conveyor wash

Perspectives from the Car Wash Owner

- Water is considered a precious resource (On the Front Range)
- Conservation is a matter of;
 - Economics
 - Being a good steward of resources.
 - It's good to be seen as a "Green" business
 - ICA's Water Savers program is great advertising
- Be seen as a partner with our local Utility.
 - Drought conditions – ex. Denver Water Board

Perspectives from the Car Wash Customer

- We use a lot of water !
- Don't understand reclaim vs. fresh water (don't care)
 - Subaru commercial – rainfall cleaning your car
- Don't understand the concept of waste water vs. storm water.
- Education is a key component – before the drought
 - ICA Water Savers program
 - Its all “fun and games” until we have a prolonged drought