- Adaptive Quasi-Dynamic Traffic Light Control - https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7229317

Published August 2016.
Good in depth overview of used methods with many good reference papers.
Outlined approach models an interesections as a stochastic hybrid system. Highly complex mathematical approach.
Very promising results -> look for new publications from authors
Look into referenced papers for state-of-the-art information.

- Deep Reinforcement Learning for Autonomous Traffic Light Control - https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8492537

Deep reinforcement learning approach built on their own simulator developed in unity3d.
Mentions collision count as shortcomming of other simulatiors which doesn't make much sense in my opinion. The described scenario should not be accounting for collisions as intersections should always be managed in a way that crossing lanes do not both get green signals.
The paper is slightly confusing, not really outlining what their baseline is.
Results only reach the same level of throughput as fixed traffic lights.

- Dynamic Allocation of Traffic Light Plans as a Traffic Reduction Strategy - https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8643139

Insight on the current state of traffic control and gathering of sensory information for the city of Medellin.
Main mode used is fixed schedules that change based on daytime without respect to current load.
Approach is to gather as much information as possible throughout the city and change the fixed intervals based on this information.
No real machine learning approach is used here.
But also discusses the use of third party information such as location data from phone providers,google,twitter to model the current traffic state on a larger scale.

- IntelliLight: A Reinnforcement Learning Approach for Intelligent Traffic Light Control - https://www.researchgate.net/publication/326504263_IntelliLight_A_Reinforcement_Learning_Approach_for_Intelligent_Traffic_Light_Control

Published july 2018

Deep reinforcement learning approach tested on a large reallife dataset. (phase gate combined with memory palace)

Comprehensive review of literature in section 2. Approach applied to single four way intersection.

Compares algorithm to several other approaches (self-organizing traffic light, a simpler deep reinforcement approach, fixed time controls)

Well written paper covering a lot of the state of the art approaches and their results

- Self-organizing Traffic Lights: A Realistic Simulation - https://arxiv.org/pdf/nlin/0610040.pdf

Interesting Paper from 2012 providing insights on the problems faced in traffic planing a decade ago.

Decent information on historical improvements and approaches used before machine learning was considered.

Possibly good for reference and to look at how traffic systems developed since then.

Paper approach discusses the green wave method vs. an adaptive algorithm to Wetstraat in Brussels. No real life application but uses simulation to improve traffic flow algorithmicly (no machine learning)

- Smart Traffic Light System Using Machine Learning - https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8603041

Implemented in Lebanon. Reinforcement based approach with real life applicabillity.

Not just simulation-based but outlines how the information on queuetime can be gathered in reallife examples.

Actual approach: Reinforcement learning (Q-Learning) trained in the simulation before applied to real intersections (SUMO).

Shows great improvements over fixed time intervals. Only applicable to single intersections without taking networks into account.

- Traffic Signal Timing via Deep Reinforcement Learning - https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=7508798

Deep q Network combining Q-Learning and a deep neural net. (Neural net is used to estimate the Q-Function here)

According to paper neural net estimation outperforms commonly used Q-Function estimators. My personal opinion is that the improvements are negligablex

- Combining Deep Q-Networks and Double Q-Learning to Minimize Car Delay at Traffic Lights - http://cs230.stanford.edu/projects_winter_2021/reports/70765188.pdf

  Short paper on improving on andrea vidalis Q-Learning approach by using a Double Q-Learning strategy in order to reduce bias of Q-Estimator relying upon itself for learning. (Introduced a second Q-Estimator where one is used to train the other). Results did not improve significantly with the

double q-learning approach.

- Multi-intersections Traffic Signal Intelligent Control Using Collaborative Q-learning algorithm - https://ieeexplore.ieee.org/document/6022063

Close to my idea of multi-intersection q-learning approach. However the paper is from 2011 and very vague on its implementation. Also the environment set for the experiment is poorly defined with only two intersections looked at and no further information on testcases used or what model they were compared against.

- Smart Traffic Light System to Control Traffic Congestion - https://www.researchgate.net/publication/348805113_Smart_Traffic_Light_System_to_Control_Traffic_Congestion_PJAEE_17_9_2020_Smart_Traffic_Light_System_to_Control_Traffic_Congestion

Three-Input fuzzy controller for (queue length,remaining green time, peak hours) that adjusts a fixed interval for a given intersection from a base value of 60 seconds green with by max +/- 35 seconds. Uses Poisson Distribution for randomized traffic occurences. (Might be helpful for own testcases!). In conclusion the fuzzy logic approach looks promising atleast for multiple consecutive intersections (only tested in straight lines, not grids)

- Overall insights for current state-of-the-art

Main modes used are fixed intervals, semi-actuated and actuated based on vehicles detected by sensors. Adaptive traffic control and real life application of machine learning approaches are rare.
But significant work has been done at least concerning single intersections with reinforcement learning based approaches (mainly q-learning) using traffic simulation tools.